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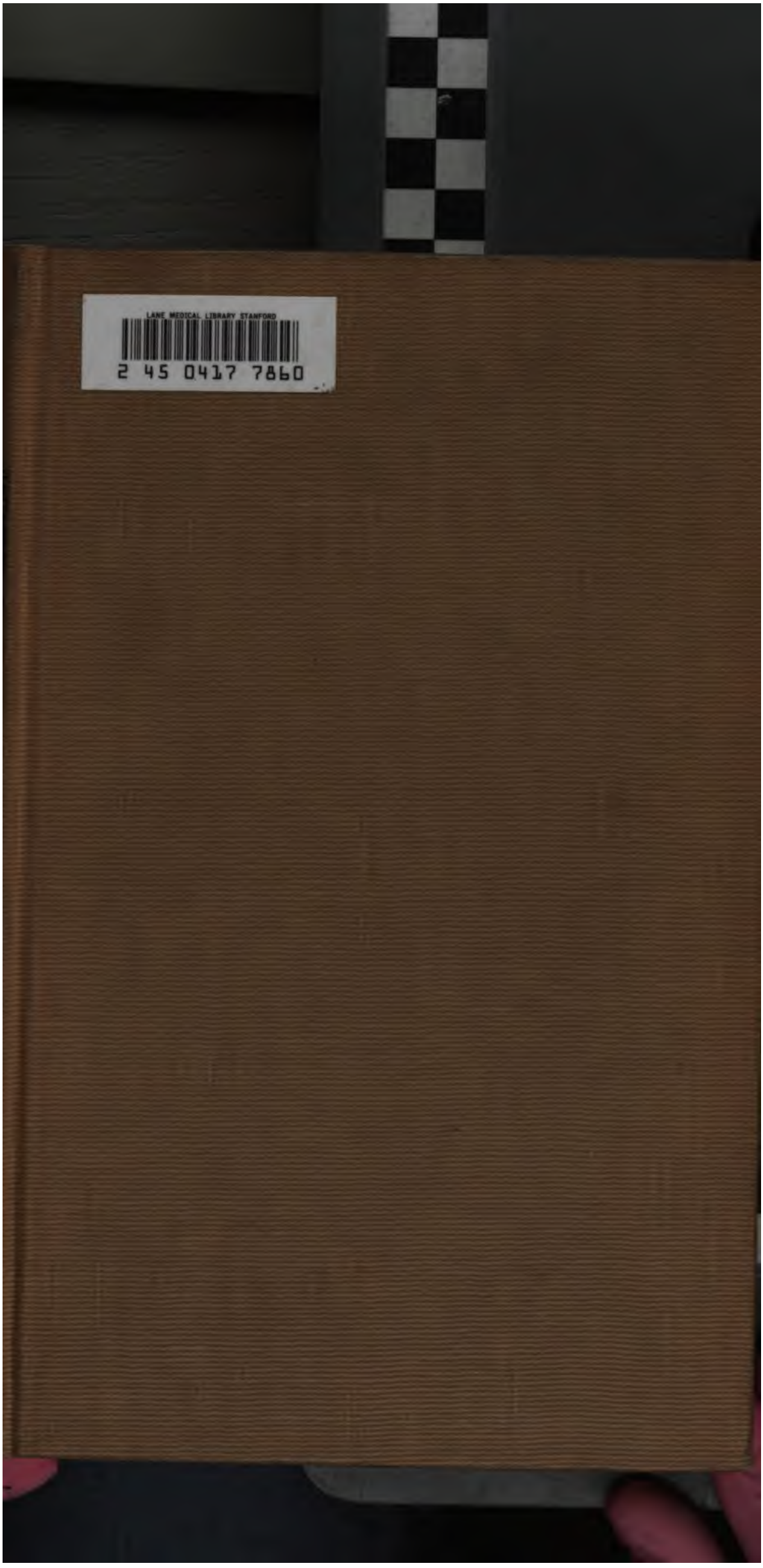
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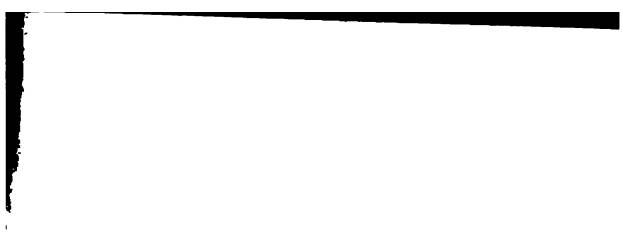

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ARMY MEDICAL DEPARTMENT

REPORT

FOR THE YEAR 1900.

WITH APPENDIX.

VOLUME XLII.

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SIR,

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I have the honour to be,
SIR,
Your most obedient Servant,
W. TAYLOR,
Director-General.

MEDICAL DIVISION, WAR OFFICE.

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ARMY MEDICAL DEPARTMENT
REPORT FOR 1900.

ARMY MEDICAL DEPARTMENT REPORT FOR 1900.

I.—HEALTH OF THE TROOPS AT HOME AND ABROAD.

Troops at Home and Abroad.

The average strength of European troops serving at home and abroad* in 1900, as computed from the returns received by the Army Medical Department, was 226,276 warrant officers, non-commissioned officers, and men. The total number of admissions to hospital was 187,284, and the total deaths 2,242. The admissions represent a ratio of 827·7 per 1,000 of strength as above; the deaths one of 9·05 per 1,000, on a strength of 247,819, which includes detached men not shown in the returns received.

Amongst the troops serving in the United Kingdom, the admission and constantly sick rates were lower, and the mortality rate higher, than in 1899. As regards zymotic diseases, only one case of small-pox occurred, but the admission rate for eruptive fevers generally was higher than in the previous year, and also higher than the average rate. Influenza was again very prevalent, causing 4,125 admissions, as compared with 2,680 in 1899, and 1,515 in 1898. There were 171 admissions for and 44 deaths from enteric fever, which shows a fractional increase in both the admission and mortality rates as compared with 1899, and is practically the same as the average rate. Chatham, with 23 cases, was the station most affected, followed by Dublin, with 14 cases, and Portsmouth and Aldershot, with 11 cases each. Regarding the cases at Chatham, it is stated that an outbreak occurred at several neighbouring villages, where a new system of drainage was being laid, which necessitated the digging up of old drains and cesspools; and to this cause the outbreak is stated to have been due. Of the total number of cases in other stations, only 10 are attributed to defects in barracks. The decline in venereal diseases still continued during the year under review, but marked variation is again observed in the prevalence of venereal diseases at individual stations. There was considerable prevalence of, with mortality from, pneumonia, and this has been generally attributed to the condition of the re-enlisted old soldiers forming the Royal Reserve, and to the embodied militia. Numbers of these were previously in bad health, and many of them are stated to have contracted the disease by exposure while under the influence of drink. 133 cases of sun-stroke, heat-stroke, and heat-apoplexy are recorded, of which 69 occurred at Aldershot in connection with a field day.

Extra hospital accommodation for invalids from South Africa was provided at Netley (770 beds), Aldershot (680 beds), Woolwich (360 beds), Devonport (170 beds), Shorncliffe (122 beds), and Colchester (100 beds). This was carried out at Netley by the erection of Doecker huts; at Aldershot, Devonport, and Woolwich by huts made in this country according to War Office design; at Shorncliffe by leasing Beach Rocks Convalescent Home; and at Colchester by hospital marquees. This has proved sufficient along with the existing accommodation in military hospitals for the reception and disposal of 34,452 invalids who returned from South Africa during the year.

* Exclusive of South Africa.

Troops at Home and Abroad.

At Gibraltar the admission and constantly sick rates were lower, but the death rate somewhat higher, than in 1899. The admission and mortality rates for enteric fever were higher than in the previous year; but there was again a decline in the admission rate for venereal diseases.

In the Malta Command, which included Crete, the admission rate was higher, and the death and constantly sick rates lower, than in the previous year. The increase in admissions is said to be due, in a great measure, to sickness among the large numbers of fresh troops which joined the Command, but it is satisfactory to note that there was a decrease in the admission rate of such diseases as enteric fever, malarial fever, and venereal diseases.

In Canada there was an increase in the admission, mortality, and constantly sick rates. The increase was due to sickness in the Special Service Battalion, Royal Canadian Regiment, which mobilized for service at Halifax during the year, and which was largely composed of young and inexperienced men.

In Bermuda it is noted that the decline of enteric fever commented upon in previous reports again continued. The admission rate for venereal diseases, which is always extremely low in this Command, showed a slight increase as compared with 1899, and this increase was attributed to disease contracted previous to arrival at the station. Non-European troops were stationed in the Command during the year and brought much venereal with them.

At Barbados the health of the troops was very good, and the ratios of admission and constantly sick were lower than in the previous year. This decrease is chiefly due to the fact that venereal diseases were much less prevalent than in 1899.

At Jamaica it is noted that the health of the troops was good. Simple continued fevers were markedly absent, and there was also marked decline in malarial fevers and venereal diseases.

In Western Africa, malarial fevers, although not so prevalent as in previous years, furnished as usual the majority of the admissions.

As regards South Africa, no annual returns of sick have been submitted, and statistics for comparative purposes cannot be prepared until after the military operations have been brought to a close.

In Mauritius the general health of the troops was much better than usual. Plague was prevalent throughout the island, particularly at Port Louis, but owing to the strict military measures adopted to prevent the disease from spreading, no case occurred among the troops. There was again a marked decline in the prevalence of malarial fevers, and the admission rate for venereal diseases was also considerably lower. The admission rate for enteric fever, however, was higher than in 1899, and also higher than the decennial average rate. The majority of the admissions for malarial fever and enteric fever came from Port Louis, which is described as being very insanitary, but as few European troops as possible are now stationed there.

In Ceylon there was a marked decrease in the admissions for malarial fevers. In 1899 troops had arrived from a malarious station in India, and the decrease in malarial fevers in 1900 is attributed to the gradual disappearance of the disease amongst them. There was a large increase in the number of cases of enteric fever, chiefly at Diyatalawa Camp, where a large number of Boer prisoners of war were incarcerated, and among whom the disease was prevalent (see Appendix IV). There was again considerable improvement in the admission rate for venereal diseases, the general type of which was stated to have been mild.

Troops at Home and Abroad.

In the Straits Settlements the health of the troops has been exceptionally good. The marked decrease in the admission rate for venereal diseases noted in 1899 again continued, and the disease is stated to be gradually declining, the satisfactory state of affairs being mainly due to the stringent measures put into force by the new local ordinance. Malarial fevers also contributed fewer admissions than in the previous year.

In China the ratios of admission and constantly sick were lower than in 1899. Plague was again epidemic among the civil population, but the troops enjoyed comparative immunity, only one admission occurring. There was a marked decline in the admission rate for venereal diseases as compared with the previous year. The local ordinance referred to in last year's report is stated to have worked well and helped to considerably diminish the number and severity of these affections.

In India there was a decline in the admission and constantly sick rates, but an increase in the death and invaliding rates. The chief causes of sickness, were, as usual, malarial fevers and venereal diseases, which together caused 54·16 per cent. of the admissions for all causes. Malarial fevers were more prevalent, and enteric fever, venereal diseases, and dysentery were all less prevalent than in 1899. The decrease in enteric fever has been attributed to the cessation of the usual reliefs and the consequently diminished number of susceptible individuals arriving in the country. Cholera caused 107 admissions with 88 deaths, and was noted as being widespread. The disease was very prevalent among the native population. Plague, which was epidemic in several localities among the natives, caused six cases among the troops, only one of which was fatal.

In Egypt, the general health of the troops was good, and bears a satisfactory comparison with the previous year. A severe epidemic of enteric fever occurred at Alexandria, and was attributed to defects in the water supply. Larger filtering beds and a new source of intake are now to be provided. The disease was also present in an epidemic form among the civil population, especially in the English and Greek communities. An outbreak of scarlet fever occurred among the 3rd Battalion Seaforth Highlanders at Cairo during the later portion of the year, the outbreak being attributed to parcels sent from localities in Scotland where the disease was rife. The battalion was placed under canvas and all parcels disinfected, with satisfactory results. Venereal disease was less prevalent than in 1899.

Khartum was again used, during a portion of the year, as a station for British troops.

The comparative statistics of results of sickness, in the several commands in which the troops were stationed, are exhibited in the following table :—

1900.

European Troops.	Average Strength.	Admitted into Hospital.	Died.	Sent Home as Invalids.	Discharged as Invalids.	Constantly non-effective from Sickness.
Troops at Home and Abroad	**226,276**	**187,284**	**2,242**	**2,612**	**5,973**	**10,049·67**
United Kingdom ..	132,921	87,078	1,023	—	5,074	4,564·01
Gibraltar..	4,858	2,573	24	102	59	180·37
Malta	8,732	8,052	54	229	68	427·67
Egypt and Cyprus ..	3,767	2,934	26	68	30	174·55
Canada	1,768	1,638	12	14	11	61·63
Bermuda	632	233	3	6	12	11·67
Barbados	714	597	7	14	7	41·73
Jamaica	566	342	4	13	6	25·01
Western Africa.. ..	78	161	—	19	—	6·93
South Africa and St. Helena						
Mauritius	463	349	3	9	3	26·05
Ceylon	1,030	844	11	20	5	39·46
China	1,484	1,986	26	69	13	123·93
Straits Settlements ..	527	338	4	23	8	24·22
India	60,553	69,225	930	2,026	677	4,342·21
On board Ship	8,183	10,934	115	—	—	—

1900.

European Troops.	Ratio per 1,000 of Strength.					Average sick-time to each Soldier.	Average duration of each Case of Sickness.
	Admitted.	Died.	Sent Home as Invalids.	Discharged as Invalids.	Constantly non-effective from Sickness.		
Troops at Home and Abroad ..	*627·7	†9·05	‡30·67	§24·93	‖46·08	Days.‖ **16·82**	Days.‖ **20·80**
United Kingdom ..	655·1	6·62	—	32·85	34·34	12·53	19·13
Gibraltar	529·6	4·94	21·00	12·15	37·13	13·55	25·59
Malta	922·1	6·18	26·22	7·79	48·98	17·88	19·39
Egypt and Cyprus ..	778·9	6·90	18·05	7·96	46·34	16·91	21·71
Canada	926·5	6·79	7·92	6·22	34·97	12·77	13·78
Bermuda	368·7	4·75	9·49	18·99	18·46	6·74	18·28
Barbados	836·1	9·80	19·61	9·80	58·45	21·33	25·51
Jamaica	604·2	7·07	22·97	10·60	44·19	16·13	26·69
Western Africa ..	2064·1	—	243·59	—	88·72	32·38	15·68
South Africa and St. Helena							
Mauritius	753·8	6·48	19·44	6·48	56·26	20·54	27·24
Ceylon	819·4	10·68	19·42	4·85	38·31	13·98	16·67
China	1338·3	17·52	46·49	8·76	83·54	30·49	22·78
Straits Settlements ..	641·4	7·59	43·64	15·18	45·96	16·77	26·15
India	1143·2	15·36	33·46	11·18	71·71	26·17	22·90
On board Ship	1336·2	14·05	—	—	—	—	—

* Calculated on strength excluding men detached.
† Calculated on strength including men detached.
‡ Calculated on strength excluding United Kingdom and troops on board ship.
§ Calculated on strength including men detached, and excluding troops on board ship.
‖ Calculations exclude men detached and troops on board ship.

Troops at Home and Abroad.

1890 to 1899.

European Troops.	Aggregate strength for 10 years.	Admitted into Hospital.	Died.	Sent Home as Invalids.	Discharged as Invalids.	Constantly non-effective from Sickness.
Troops at Home and Abroad ..	**2,006,379**	**1,970,853**	**18,045**	**26,651**	**31,052**	**116,924·57**
United Kingdom ..	991,820	700,716	4,361	—	17,470	40,358·22
Gibraltar	47,047	34,904	180	678	444	2,376·62
Malta	81,154	63,378	728	2,049	939	3,962·81
Egypt and Cyprus ..	44,423	42,905	583	1,480	541	2,901·92
Canada	14,712	7,725	54	198	149	351·18
Bermuda	15,095	7,603	126	187	107	409·13
Barbados	7,420	9,809	58	185	108	622·52
Jamaica	5,560	4,463	69	139	85	276·48
Western Africa ..	452	1,208	20	117	6	42·22
South Africa and St. Helena	42,559	36,987	314	844	546	2,371 31
Mauritius	6,534	8,397	89	314	84	472·91
Ceylon	13,193	13,288	117	258	136	737·97
China	14,536	22,299	168	610	217	1,217·64
Straits Settlements ..	13,205	14,855	88	242	119	951·18
India	678,967	970,364	10,889	19,350	10,101	59,872·46
On board Ship ..	29,702	31,952	197	—	—	—

1890 to 1899.

European Troops.	Ratio per 1,000 of Strength.					Average sick-time to each Soldier.	Average duration of each Case of Sickness.
	Admitted.	Died.	Sent Home as Invalids.	Discharged as Invalids.	Constantly non-effective from Sickness.		
						Days.	Days.
Troops at Home and Abroad ..	**982·3**	**8·89**	**27·06**	**15·52**	**59·15**	**21·59**	**22·01**
United Kingdom ..	706·5	4·29	—	17·20	40·69	14·85	21·02
Gibraltar	741·9	3·83	14·41	9·44	50·52	18·44	24·85
Malta	781·0	8·97	25·25	11·57	48·83	17·82	22·82
Egypt and Cyprus ..	965·8	13·24	33·32	12·18	65·32	23·84	24·69
Canada	525·1	3·67	13·46	10·13	23·87	8·71	16·59
Bermuda	503·7	8·35	12·39	7·09	27·10	9·89	19·64
Barbados	1321·9	7·82	24·93	14·55	83·90	30·62	23·16
Jamaica	802·7	12·41	25·00	15·29	49·73	18·15	22·61
Western Africa ..	2672·6	44·25	258·85	13·27	93·41	34·09	12·76
South Africa and St. Helena	869·1	7·38	19·83	12·83	55·72	20·34	23·40
Mauritius	1285·1	13·47	48·06	12·86	72·38	26·42	20·56
Ceylon	1007·2	8·87	19·55	10·31	55·93	20·42	20·27
China	1534·0	11·56	41·96	14·93	83·77	30·57	19·93
Straits Settlements ..	1124·9	6·66	18·33	9·01	72·03	26·29	23·37
India	1429·2	16·04	28·60	14·88	88·18	32·19	22·52
On board Ship ..	1075·8	6·63	--	—	—	—	—

II.—ON THE HEALTH OF THE TROOPS SERVING IN THE UNITED KINGDOM.

Sickness and Mortality

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lom.

The average strength of warrant officers, non-commissioned officers and men who served in the United Kingdom during the year 1900 was 132,921, according to the returns furnished by medical officers. In addition to this there were certain men detached from their corps, the average number of whom is computed to have been 21,543.

The following table gives the general statistics of sickness and mortality among the troops quartered in the three divisions of the kingdom, England and Wales, Scotland, and Ireland, and also in the United Kingdom as a whole:—

1900.	Average Strength.	Admissions.	Deaths.	Invalids.	Constantly Sick.
England and Wales	98,728	65,885	791	4,190	3,465·83
Scotland	7,736	3,446	57	102	154·66
Ireland	26,457	17,747	175	782	943·52
United Kingdom.. ..	132,921	87,078	1,023	5,074	4,564·01

(*continued.*)

1900.	Ratios per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.
	Admissions.	Deaths.*	Invaliding.*	Constantly Sick.		
					Days.	Days.
England and Wales ..	667·3	6·89	36·48	35·10	12·81	19·20
Scotland	445·4	6·55	11·72	19·99	7·30	16·38
Ireland	670 8	5·66	25·30	35·66	13·02	19·40
United Kingdom..	655·1	6·62	32·85	34·34	12·53	21·02

* These ratios are calculated on a strength including men detached.

Comparing the above with the corresponding table in the previous year it is observed that in England and Wales the admission rate shows a decrease of 24·0 per 1,000, the death rate an increase of 2·52, and the constantly sick rate a decrease of 3·01 per 1,000. The average sick time to each soldier was shorter by 1·09 days, and the average duration of each case of sickness was also shorter by ·91 of a day. Compared with average ratios for the preceding ten years there was a decrease of 60·3 per 1,000 in the admission rate, of 7·40 in the ratio of constantly sick, but the rate of mortality was higher by 2·56 per 1,000. The average sick time to each soldier and the average duration of

each case of sickness have both decreased to the extent of 2·70 and 2·12 days respectively. *United Kingdom.*

In Scotland the admission and mortality rates were lower than those of the preceding year by 78·7 and 1·75 per 1,000, and the ratio of constantly sick also showed a decrease of 4·45 per 1,000. The average sick time to each soldier and the average duration of each case of sickness were less by 1·62 days and ·64 of a day respectively, in comparison with corresponding averages in the previous year. In comparison with the ratios for the preceding ten years, the ratio of admission shows a decrease of 136·6, that of constantly sick one of 6·08, and the mortality rate an increase of 1·37 per 1,000. The average sick time to each soldier was shorter by 2·22 days, but the average duration of each case of sickness was longer by ·03 of a day.

In Ireland the admission, mortality, and constantly sick rates as compared with the corresponding rates in the previous year, all show an increase to the extent of 41·4, 2·34, and ·26 per 1,000 respectively. The average sick time to each soldier was higher by ·10 of a day, and the average duration of each case of sickness lower by 1·13 days. In comparison with the decennial average rates an increase is shown amounting to 13·7 in the rate of admission, to 1·62 in that of mortality, but a decrease of 1·55 per 1,000 is shown in that of constantly sick. The average sick time to each soldier and the average duration of each case of sickness have also decreased by ·56 of a day and 1·27 days respectively.

In comparison with the previous year the United Kingdom as a whole shows a decrease in the admission and constantly sick rates of 15·5 and 2·59 per 1,000 respectively, but an increase in the mortality rate of 2·32 per 1,000. The average sick time to each soldier and the average duration of each case of sickness are less by ·95 and ·97 of a day respectively, than the similar averages in the previous year. In comparison with the corresponding ratios for the preceding ten years there is a decrease in the ratios for admissions and constantly sick of 51·4 and 6·35 respectively, but the rate of mortality shows an increase of 2·33 per 1,000. The average sick time to each soldier and the average duration of each case of sickness are less by 2·32 and 1·89 days respectively.

The total loss to the service by death and discharge by invaliding on account of medical unfitness, during the year was 6,097 men, equal to a ratio of 39·47 per 1,000 of the strength, which is above the previous year's rate by 17·05.

The more important statistics of sickness, mortality, and invaliding, according to the different sections of disease, are given for the whole of the troops in the United Kingdom in Abstract I, and for the troops quartered in the three divisions of the Kingdom in Abstracts A, B, and C.

General Diseases.—For *eruptive fevers* there were 1,456 admissions and 15 deaths, giving ratios per 1,000 of 11·0 and ·10 as compared with 8·3 and ·08 in the previous year, and 9·3 and ·06 for the preceding ten years.

There was a single admission for *small-pox* during the year. The case occurred at Scarborough in a man of the Yorkshire Artillery (embodied militia) and was of a modified type; the man bore satisfactory marks of vaccination. A case of this disease occurred at Strensall Camp in the preceding year, and 3 represents the average number of admissions for the preceding ten years.

Scarlet fever caused 600 admissions and 9 deaths, equal to ratios of 4·5 and ·08 per 1,000, as compared with 3·5 and ·07 in the previous year, and 4·0 and ·06, the average for the preceding ten years.

Of the total, 478 cases occurred in England and Wales, 43 in Scotland, and 79 in Ireland. The Aldershot, Southern, and Home Districts, furnished the highest figures with 136, 105, and 53 respectively; while the Curragh district was lowest with 1 admission. The greatest number of cases occurring at any one station was 136 at Aldershot with 4 deaths, followed by 41 at Chatham with no deaths.

In both places it is stated that the disease was repeatedly introduced by the arrival of troops in the station from all parts of the United Kingdom.

The other stations furnishing double figures were Portsmouth 37, Dublin 33, Gosport 29, Queenstown 28, Winchester 18, Aberdeen 17 Norwich 16,

London 15, Caterham 14, Woolwich 14, York 12, Edinburgh Castle 12, Hounslow 11, Pontefract 11, and Liverpool 10.

Of the deaths 4 occurred at Aldershot and 1 each at Colchester, Portsmouth, Glasgow, Queenstown, and Templemore.

Measles caused 720 admissions and 6 deaths. The admission ratio, 5·4, and that of mortality, ·05 per 1,000, are above the previous years' ratios by 3·8 and ·04, and also higher than the decennial average rates by 3·9 and ·05 per 1,000 respectively. The admissions in England and Wales numbered 651, in Scotland 12, and in Ireland 57, as compared with 121, 8, and 30, in the previous year. The stations most affected were Aldershot, where all the deaths occurred, Caterham, Shorncliffe, London, Woolwich, Dublin, and Gosport.

The remaining admissions for *other eruptive fevers* included 128 of cow-pox and 8 of chicken-pox.

Influenza was the origin of 4,125 admissions, as compared with 2,680 admissions in the previous year, and 1,515 in 1898. The ratio per 1,000 equalled 31·0, which is above that given in the previous year by 4·2, and that of the decennial average rate by 10·1. There were 12 deaths, giving a ratio of ·08, which is fractionally above the ratio of the preceding year, and higher than the decennial average rate by ·04.

For *diphtheria* there were 69 admissions with 4 deaths, giving ratios of ·5 and ·03 per 1,000, as compared with ·3 and ·01 in the previous year. Of the admissions, 13 occurred in the South-Eastern district, 13 in the Cork district, 10 in the Home, 9 in the Woolwich, 5 each in the Aldershot and Dublin, 4 in the Southern, 3 in the Thames, 3 in the Scottish, 2 in the Eastern, and 1 each in the North-Western and Western districts.

Enteric Fever is represented by 171 admissions and 44 deaths, giving ratios of 1·3 and ·28 per 1,000, which are above those of the previous year by ·3 and ·03 respectively; while in comparison with the decennial average ratios, the admission ratio shows no change, but the mortality rate gives an increase of ·04. The percentage of mortality to attack was 25·7, as compared with 25·2 in the previous year, and 19·2 the decennial average. In the three divisions of the United Kingdom the incidence was as follows:—England and Wales 114 admissions with 32 deaths, equal to ratios of 1·2 and ·28 per 1,000, both being higher than in the previous year by ·2 and ·04 respectively, while in comparison with the decennial average rates, the increase is observed to be ·1 and ·08 per 1,000 respectively. In Scotland there were 10 admissions with 2 deaths, the ratios being 1·3 and ·23 respectively, the former showing an increase of ·8 on the rate in the preceding year, while the death rate shows no change. In comparison with the decennial average rates, that of admission shows an increase of ·7, and that of mortality an increase of ·10. There were 47 admissions and 10 deaths in Ireland, giving ratios of 1·8 and ·32 per 1,000, showing an increase on the ratios of the previous year of ·5 and ·02 respectively, but a decrease as compared with the decennial average rates of ·1 and ·05 respectively.

As regards the incidence of disease by districts, the number of admissions is in the following order:—

Districts.	Number of Admissions.	Districts.	Number of Admissions.
Southern..	29	Cork	9
Thames	27	Home	8
Belfast	20	Western	5
Dublin	15	Woolwich	5
South-Eastern	12	North-Eastern	4
North-Western ..	11	Curragh	3
Aldershot	11	Eastern..	2
Scottish	10		

By stations the numbers are as follows, tabulated according to the quarter of the year in which the admissions occurred :— *United Kingdom.*

Stations.	1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.	Total.
Pontefract	4	—	—	—	4
Birmingham	—	—	1	4	5
Manchester	—	1	—	—	1
Preston	—	1	—	1	2
Seaforth	—	1	—	—	1
Warrington	—	—	—	1	1
Wrexham	—	1	—	—	1
Colchester	—	1	—	—	1
Warley	—	—	—	1	1
Bristol	—	—	—	1	1
Devonport	—	1	1	—	2
Taunton	—	—	1	—	1
Tregantle	—	1	—	—	1
Sandown, I.W.	—	—	1	—	1
Netley	—	3	—	1	4
Portland	—	—	—	1	1
Gosport	—	—	7	1	8
Hilsea	—	1	3	—	4
Portsmouth	—	1	3	7	11
Chatham	4	4	7	8	23
Gravesend	1	—	—	—	1
Sheerness	—	1	—	—	1
Shoeburyness	—	—	2	—	2
Brighton	1	—	—	1	2
Canterbury	—	—	3	1	4
Dover (Western Heights) ..	4	1	—	1	6
London, N.W.	1	—	—	—	1
London, S.W.	3	2	2	—	7
Woolwich	2	2	1	—	5
Aldershot	2	4	3	2	11
Ayr	—	—	1	—	1
Fort George	—	—	1	—	1
Glasgow	—	6	—	—	6
Barry and Buddon Camps ..	—	1	1	—	2
Armagh	—	—	—	1	1
Belfast	—	—	2	3	5
Enniskillen	—	1	—	—	1
Holywood	—	4	—	—	4
Finner Camp	—	1	8	—	9
Dublin	1	—	4	9	14
Mullingar	—	—	1	—	1
Queenstown	—	—	—	1	1
Fermoy	1	—	—	—	1
Limerick	3	1	—	—	4
Templemore	—	—	1	1	2
Tipperary	1	—	—	—	1
Curragh	2	—	—	—	2
Newbridge	—	—	—	1	1
Total	30	40	54	47	171

In the majority of instances definite information as to the origin of these cases has not been given, but in one or two instances it was stated that the patients had recently returned from South Africa. In 35 of the cases the disease appears to have been due to intercourse with the civil population. The following stations have furnished these cases :—Chatham, Belfast, Hilsea, Seaforth, Shoeburyness, and Canterbury. At Chatham, where 23 admissions

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are recorded, it is stated that an outbreak of the disease occurred at Gillingham, New Brompton, and other villages in the neighbourhood. A new system of drainage was being laid which necessitated the digging up of old drains and cesspools, to which cause the outbreak is said to have been probably due. At the other stations the disease is stated to have been prevalent in the neighbourhood. In 20 cases the disease is supposed to have been imported from other stations. The stations at which such admissions occurred were:—Aldershot, Dover, Devonport, Templemore, Queenstown, Fermoy, Tipperary, Curragh, Armagh, Enniskillen, Fort George, Glasgow, and Shoeburyness. Seven of the cases which occurred at Portsmouth, and 5 of those at Gosport were said to have been contracted at Grangefield Camp, near Gosport, where some suspicion attached to the water supply. The pollution of the camping ground through prolonged occupation was also suggested as a possible cause, and the camp was eventually moved. Defective drainage is given as the probable cause in 10 cases, viz., 5 at Glasgow, 3 at Canterbury, 1 at Aldershot, and 1 at Ayr; all of the admissions at Glasgow came from the same room, and on the block being vacated the drainage was found to be ill-constructed and out of repair. In connection with the 9 cases that occurred at Finner Camp it is noted that an epidemic had broken out among the civil population in the Kinlough district, and the cause is said to have probably been due to milk from that district being sold in the camp.

There were 5 cases at Birmingham, 4 at Holywood Camp, 1 at Colchester, and 1 at Brighton, attributed to eating shell fish. At Pontefract 4 cases occurred, in 2 of which it was suspected that ice cream, which was brought into barracks, was the possible cause, and a man who was employed as a hospital orderly at this station is said to have contracted the disease while attending enteric cases. At Western Heights, Dover, 3 cases are considered to have been contracted from other cases which occurred there, and 3 cases at Netley and 1 at Brighton occurred in men employed as hospital orderlies in attendance on cases of enteric fever. At Gosport a case occurred in a patient in hospital, probably contracted from other cases under treatment; a case each at Fort George and Aldershot occurred in men whose children were suffering from enteric fever, and at Netley a case was transferred from s.s. "Persia," *en route* to South Africa, the patient having previously been stationed at Aldershot for 14 days, and prior to that at Waterford, in Ireland. Five cases are stated to have been contracted on furlough. In the remaining cases the origin was unknown or not traced.

Other continued fevers were the origin of 254 admissions and 6 deaths, giving ratios of 1·9 and ·04 per 1,000 respectively. The admission rate is below that of the previous year by 1·2, and that of the decennial average by 1·7 per 1,000. For England and Wales, the admission rate was 2·0 per 1,000, being lower than the previous year's ratio, and the decennial average rate by 1·5 and 1·4 respectively. The admission rate for Scotland was 2·1 per 1,000, and is above the rate in 1899 by ·5, but below the average rate by 2·3. In Ireland the admission rate, 1·7 per 1,000, shows a decrease of ·4 and 2·3 respectively in these comparisons. As in the previous year, the Eastern District furnished the highest rate 7·9, followed by the Belfast Channel Islands, Home and Southern Districts with 4·7, 2·9, 2·5 and 2·4 per 1,000 respectively. The lowest rates were furnished by the Curragh, Woolwich, Cork, Western and South-Eastern Districts, with ·2, ·2, ·5, ·9, and ·9 per 1,000 respectively. The deaths were due to cerebro-spinal fever in 3 instances, to simple continued fever in 2, and to typhus fever in 1 instance. In the latter case the man was admitted, while on furlough, into the City Fever Hospital, Edinburgh, where he died.

Dysentery caused 181 admissions with 5 deaths, giving ratios of 1·4 and ·03 per 1,000 respectively, which shows an increase in the ratio of admissions, as compared with the previous year, and with the decennial average rate of ·8 and ·9 respectively. There were 61 admissions in the Aldershot district, 22 in the Southern, 17 in the South-Eastern and 14 in the Thames districts. Apart from these the admissions were fairly evenly distributed throughout the various remaining districts in the United Kingdom.

Mumps gave 93 admissions as compared with 47 in the previous year. The principal stations affected were Aldershot (44 cases), Devonport (9 cases), and Shorncliffe (8 cases). *United Kingdom.*

Malarial fevers were the cause of 859 admissions and 3 deaths. The admission ratio, 6·5 per 1,000, is below the previous year's ratio, and the decennial average rate by 2·6 and ·5 respectively. Of the admissions 708 were furnished by England and Wales, 18 by Scotland, and 133 by Ireland. The admission rate for England and Wales is lower than the rate in the preceding year by 2·6, and than the average rate by ·9. In Scotland an increase of ·2 is observed in comparison with the previous year's rate, but compared with the decennial average rate a decrease of ·4 is noted. In Ireland a decrease of 2·7 has taken place as compared with the ratio in 1899, but in comparison with the decennial average rate an increase of ·7 has occurred. Of the total cases 6 are recorded as remittent fever, and 1 death was due to this cause, the remaining deaths being shown as ague. Most of the admissions were amongst men who had recently served in South Africa.

Septic diseases caused 233 admissions (223 of which were cases of erysipelas), and 7 deaths, equal to ratios of 1·8 and ·04 per 1,000 respectively. The admission rate shows an increase on that of the previous year of ·8, and on that of the decennial average of ·4, while the death rate shows a decrease in the two comparisons of ·04 and ·03 respectively.

The comparisons in the three divisions are as follows :—

	Ratio per 1,000 of strength.					
	Admissions.			Deaths.		
	1900.	1899.	1890–99.	1900.	1899.	1890–99.
England and Wales	1·9	1·1	1·4	·06	·09	·08
Scotland	1·4	2·1	1·6	—	—	·10
Ireland	1·1	·5	1·1	—	·04	·03

The deaths from septic diseases in the United Kingdom were due to erysipelas (5), pyæmia (1), and septicæmia (1).

Tubercular diseases were the origin of 493 admissions and 121 deaths, the equivalent ratios being 3·7 and ·78 per 1,000, which, compared with those of the previous year, show an increase of ·9 in the former and ·19 in the latter, and also an increase in comparison with the decennial average rate of ·4 and ·08 respectively. The ratios of admission and mortality in England and Wales were 3·8 and ·76 per 1,000, and are higher than the previous year's rates by ·9 and ·23, and than those of the preceding ten years' average by ·5 and ·08 respectively. In Scotland, the ratios of admission and mortality, 2·7 and ·57 per 1,000, were less than in the previous year by ·8 and 1·51 and than those of the decennial average by ·7 and ·41. In Ireland the rates were 3·7 and ·94, being higher than the previous year's rates by 1·1 and ·43, and than the average by ·4 and ·21 respectively. Tubercle of lung furnished 436 of the admissions and 104 of the deaths. The incidence of tubercular disease year by year amongst the troops in the United Kingdom is shown in the following table :—

Year.	Ratio per 1,000 of strength.			Remarks.
	Admitted.	Died.	Invalided.	
1886	3·9	1·17	1·60	
1887	3·6	1·10	1·65	
1888	3·7	1·03	1·65	
1889	3·6	·92	1·72	
1890	3·9	1·02	2·11	
1891	3·2	·76	1·81	
1892	3·1	·79	1·67	
1893	3·1	·76	1·60	
1894	3·2	·80	1·58	
1895	3·0	·67	1·56	
1896	2·6	·61	1·63	Includes scrofula, in accordance with new nomenclature of diseases.
1897	2·4	·52	1·44	
1898	2·5	·48	1·36	
1899	2·8	·59	1·42	
1900	3·7	·78	1·81	

Venereal Diseases.—For *primary syphilis* there were 2,492 admissions, giving a ratio of 18·7 per 1,000, as compared with 26·7 in 1899 and 48·2 for the decennial period. The ratio of constantly sick for this affection was 1·63 per 1,000, which is lower than in the previous year by ·87, and than the average of the preceding ten years by 3·01 per 1,000.

Soft Chancre was the cause of 976 admissions and 74·49 men constantly sick, equal to ratios of 7·3 and ·56 per 1,000. In England and Wales the admissions and constantly sick numbered 742 and 59·44, in Scotland 9 and ·22, and in Ireland 225 and 14·83. Adding the sickness for this affection to primary syphilis, the ratio of admission and constantly sick from *primary venereal sores* in the United Kingdom amounted to 26·0 and 2·19 per 1,000 respectively, or lower than the rates in 1899 by 11·9 and 1·15, and than the decennial average rates by 37·2 and 3·63 respectively.

Secondary Syphilis.—The admissions were 1,941 in number, the deaths 11, and the constantly sick 193·98. The ratios of admission and constantly sick were 14·6 and 1·46 per 1,000, which are below the rates in the previous year by 10·0 and 1·22, and those of the decennial average by 17·6 and 1·92 per 1,000.

Gonorrhœa was the cause of 6,993 admissions, and 429·67 men were constantly ineffective from this disease; the ratios equalled 52·6 and 3·23 per 1,000 respectively, showing a decrease as compared with those of the previous year of 7·3 in the former and of ·78 in the latter, and also a decrease in comparison with the average rates for the preceding ten years of 23·7 and 2·13 respectively.

The incidence of the several forms of venereal disease in the three divisions of the United Kingdom in 1900 as compared with 1899, and with the preceding decennial period, is shown in the following table :— *United Kingdom.*

Disease and Division.		Ratio per 1,000 of Strength.					
		Admissions.			Constantly Sick.		
		1900	1899	1890 -99	1900	1899	1890 -99
Primary Syphilis.	England and Wales ..	18·7	26·3	52·0	1·74	2·55	5·05
	Scotland	12·0	16·9	25·0	·80	1·29	2·05
	Ireland	21·1	29·9	39·9	1·48	2·59	3·77
Primary venereal sores (*i.e.*, Primary Syphilis and Soft Chancre).	England and Wales ..	26·2	37·0	67·5	2·34	3·37	6·29
	Scotland	13·2	26·5	40·3	·83	1·82	2·99
	Ireland	29·6	43·1	53·2	2·04	3·57	4·80
Secondary Syphilis.	England and Wales ..	15·2	26·2	34·9	1·53	2·88	3·75
	Scotland	9·8	20·5	22·1	·63	1·82	1·64
	Ireland	13·6	20·1	25·3	1·43	2·18	2·50
Gonorrhœa.	England and Wales ..	51·3	59·0	79·1	3·27	3·98	5·56
	Scotland	42·1	46·1	64·1	1·96	2·45	3·65
	Ireland	60·6	65·4	69·4	3·46	4·40	4·97

Taking *all forms of venereal disease* together, the admissions in the United Kingdom numbered 12,402, and the constantly sick 914·95. The total ratio of admissions for venereal diseases, therefore, was 93·2, and that of constantly sick, 6·88 per 1,000, being lower than the preceding year's ratios by 29·2 and 3·15, and than the average of the preceding ten years by 78·5 and 7·68 per 1,000 respectively.*

* There were 235 admissions for ulcer of penis of non-venereal origin with 11·79 men constantly sick. If, as in former years (prior to 1897), these cases were included with those of primary syphilis and soft chancre under the head of primary venereal sores, the admission and constantly sick rates for all forms of venereal diseases in the United Kingdom would equal 95·0 and 6·97 per 1,000 respectively.

The incidence of all forms of venereal diseases taken together shows the following comparison :—

	Ratio per 1,000 of Strength.					
	Admissions.			Constantly Sick.		
	1900.	1899.	1890-99.	1900.	1899.	1890-99.
England and Wales ..	92·7	122·2	181·5	7·14	10·23	15·60
Scotland	65·1	93·1	126·5	3·42	6·09	8·28
Ireland	103·8	128·6	147·9	6·93	10·15	12·27

The following shows the admission rates for all venereal diseases according to districts :—

Districts.	Ratio per 1,000 of Strength.		
	1900.	1899.	Increase or decrease.
Dublin	214·1	208·4	+5·7
Channel Islands	156·2	144·7	+11·5
Woolwich	153·9	137·2	+16·7
Western	140·6	168·6	−28·0
Home	132·2	150·2	−18·0
North-Eastern	105·2	125·5	−20·3
Belfast	94·4	176·3	−81·9
Thames	85·7	101·7	−16·0
Aldershot	84·4	96·2	−11·8
Southern	82·3	146·3	−64·0
Eastern	65·4	123·3	−57·9
Scottish	65·1	93·1	−28·0
North-Western	63·1	105·7	−42·6
South-Eastern	62·9	84·4	−21·5
Curragh	57·3	94·3	−37·0
Cork	51·9	69·1	−17·2
Salisbury Plain	19·9	—	

The incidence of venereal disease in stations, the average annual strength of which exceeded 1,000, was as follows :— *United Kingdom.*

Station.	Strength.	Ratio per 1,000 of Strength. Admissions for Venereal diseases.	Station.	Strength.	Ratio per 1,000 of Strength. Admissions for Venereal diseases.
Dublin	4,916	281·5	Edinburgh (Edinburgh Castle, Piershill, Leith Fort and Glencorse.)	1,770	62·7
Devonport	3,842	241·5			
London	3,500	216·6			
Woolwich	5,210	153·9			
Cork	1,161	125·8			
Chatham	3,677	123·2	Curragh	4,817	57·3
Windsor	1,282	100·6	Lichfield	1,294	57·2
Portsmouth (Gosport, Hilsea and Portsmouth).	7,057	91·2	Canterbury	1,964	55 0
			Hounslow	1,278	54·0
			Finner Camp ..	1,355	53·1
Aldershot	20,234	86·6	Caterham	1,062	47·1
Shorncliffe	3,615	78·0	Warley	1,276	41·5
York	2,983	73·1	Gravesend	1,133	36·2
Colchester	3,407	67·5	Pembroke Dock ..	1,784	35·3
Dover	2,956	65·3	Fort George ..	1,054	26·6
			Barry Camp ..	1,173	23·0
			Queenstown ..	1,085	23·0
			Salisbury Plain ..	3,068	19·9
			Kilworth Camp ..	1,667	11·4

Amongst stations with an average annual strength varying between 500 and 1,000 the ratios of venereal disease were as follows :—

Station.	Strength.	Ratio per 1,000 of Strength. Admissions for Venereal diseases.	Station.	Strength.	Ratio per 1,000 of Strength. Admissions for Venereal diseases.
Sheffield	523	242·8	Portland	699	58·7
Jersey	760	239·5	Tipperary	713	50·5
Belfast	882	233·6	Shoeburyness ..	735	47·6
Glasgow	749	165·6	Fermoy	910	44·7
Norwich	722	157·9	Staddon Heights Camp	508	41·3
Newcastle-on-Tyne ..	846	118·2			
Tregantle	948	118·1	Dundalk	536	41·0
Exeter	531	97·9	Woking	972	38·1
Parkhurst (I.W.) ..	551	96·2	Dorchester	662	31·7
Bristol	536	87·7	Golden Hill Fort (I.W.)	832	31·3
Holywood	695	86·3			
Athlone	679	85·4	Sheerness	969	26·8
Limerick .. .	950	80·0	Mullingar	565	26 5
Pontefract	506	73·1	Lydd	779	11·6
Ballincollig	501	71·9	Landguard Fort ..	584	6 8
Preston	927	67·9			

United Kingdom.

Amongst stations with an average strength varying between 100 and 500 the ratios were as follows:—

Station.	Strength.	Ratio per 1,000 of Strength. Admissions for Venereal disease.	Station.	Strength.	Ratio per 1,000 of Strength. Admissions for Venereal disease.
Leeds..	289	297·6	Fleetwood	272	55·1
Waterford	118	254·2	Clonmel	329	54·7
Berwick	214	200·9	Shrewsbury ..	165	54·5
Ayr	163	196·3	Altcar Camp ..	350	54·3
Cardiff	383	193·2	Templemore ..	368	51·6
Bradford	141	184·4	Liverpool	393	50·9
Bodmin	187	165·8	Weedon	376	50·5
Halifax	199	155·8	Wrexham	228	48·2
Ashton	169	153·8	Great Yarmouth ..	191	47·1
Ipswich	300	143·3	Perth	298	47·0
Bedford	147	142·9	Stirling	341	46·9
Bury (Lancs.) ..	134	134·3	Kilkenny	306	45·8
Brighton	428	121·5	Sandown (I.W.) ..	423	44·9
Carlisle	165	115·2	Bury St. Edmunds	164	42·7
Hamilton	407	110·6	Alderney	259	42·5
Leicester	267	108·6	Longford	151	39·7
Netley	373	107·2	Beverley	242	37·2
Scarborough ..	392	107·1	Kingston-on-Thames	223	35·9
Londonderry ..	432	101·9	Brecon	141	35·5
Christchurch ..	128	101·6	Buttevant	396	35·4
Warrington	317	97·8	Aberdeen	339	35·4
Maidstone	279	96·8	Winchester ..	260	34·6
Birmingham.. ..	137	94·9	Guildford	233	34·3
Reading	269	92·9	Eastbourne ..	148	33·8
Newry	360	91·7	Naas	178	33·7
Coventry	125	88·0	Enniskillen ..	299	33·4
Lancaster	214	84·1	Warwick	254	27·6
Oxford	184	81·5	Whitley Camp ..	198	25·3
Manchester (Hulme)	284	77·5	Chichester	282	21·3
Newport (Mon.) ..	387	77·5	Okehampton ..	146	20·6
Armagh	168	77·4	Devizes	156	19·2
Lincoln	146	75·3	Worcester	156	19·2
Derby	186	75·3	Omagh	168	17·9
Lanark Camp ..	417	74·3	Tralee	308	16·2
Cahir..	240	66·7	Northampton ..	198	15·2
Weymouth	352	65·3	Beaumaris	134	14·9
Inverness	262	64·9	Kinsale	409	12·2
Guernsey	357	61·6	Chipping Camp ..	333	12·0
Chester	248	60·5	Pendennis	329	8·7
Birr	318	59·7	Hythe	260	7·7
Richmond (Yorks.)..	156	57·7	Harwich	354	5·6
Taunton	174	57·5	Montrose	455	—
Galway	195	56·4			

Hydrophobia.—A death occurred out of hospital at Paris, in a man who had been sent to the Pasteur Institute there for treatment.

Parasitic Diseases.—There were 3,770 admissions recorded under this head with 123·99 men constantly sick, the respective ratios being 28·4 and ·93 per 1,000. Of the total admissions, scabies furnished 3,428, or 91 per cent. of this class of diseases. There were also 177 admissions for ringworm, 84 for phthirius inguinalis, 43 for tænia solium, and 36 for pediculus. The ratios per 1,000 for scabies were, in England 25·9, in Scotland 22·10, and in Ireland 26·61.

For *scurvy* there were 7 admissions, 2 of which occurred at Aldershot and 1 each in the Thames, Scottish, Belfast, Dublin and Cork districts.

Alcoholism caused 672 admissions and 22 deaths. 53 of the admissions and 11 of the deaths were due to delirium tremens. The ratio per 1,000 for alcoholism equalled 5·1 for admissions and ·14 for mortality, being higher than the previous year's rates by 3·0 and ·07, and than those of the decennial average by 3·3 and ·10 respectively. In England and Wales the admission rate was 5·3, in Scotland 5·3, and in Ireland 4·1 per 1,000. *United Kingdom.*

Under *rheumatism* are recorded 4,855 admissions and 10 deaths, equal to ratios of 36·5 and ·06 per 1,000 respectively. Compared with the previous year's admission rate, an increase of 8·4 is observed, but the mortality rate shows a decrease of ·02; and in comparison with the decennial average rates, that of admission has increased by 5·1, while the death rate shows no change.

The comparisons in the three divisions are as follows:—

	Ratio per 1,000 of strength.					
	Admissions.			Deaths.		
	1900.	1899.	1890-99.	1900.	1899.	1890-99.
England and Wales	36·3	30·5	33·2	·08	·08	·06
Scotland	27·5	17·9	22·7	--	·23	·18
Ireland	40·1	21·9	27·1	·03	·04	·05

Amongst the districts the greatest prevalence of rheumatic affections was in the Aldershot, Cork, Channel Islands, Home, Dublin, and Eastern, with 46·6, 46·6, 46·5, 45·7, 44·6, and 40·0 respectively; and the lowest in the Western, Salisbury Plain, Scottish, Belfast, Woolwich, and South-Eastern districts with 24·9, 27·4, 27·5, 28·1, 29·2, and 29·5. Of the total admissions, 363 were for rheumatic fever, and all the deaths were due to this cause.

Debility.—Under this head 1,650 admissions are shown as compared with 833 in the previous year, the ratio per 1,000, 12·4, showing an increase on that of the previous year of 4·1, and on the average rate of 5·1. There were 2 deaths.

Other General Diseases accounted for 548 admissions, with 17 deaths, giving ratios of 4·1 and ·11 respectively, being exactly similar to those in the previous year. The admissions included 231 of non-malignant new growth, 76 of anæmia, 59 of congenital malformations, 24 of cyst, 21 of malignant new growth, and 137 of other ailments (including 93 cases of mumps already referred to). The deaths were due to malignant new growth (10), diabetes mellitus (3), mumps (1), gangrene (1), purpura (1), and leucocythemia (1).

Local Diseases.—*Diseases of the Nervous System.*—There were 1,806 admissions and 62 deaths, giving ratios of 13·6 and ·40 per 1,000 respectively, which are higher than the corresponding ratios for the previous year by 5·2 and ·18, and than the decennial average rates by 5·4 and ·13 per 1,000. For England and Wales the ratios of admission and mortality were 13·5 and ·43, being above the ratios for 1899 by 5·1 and ·18, and also above those of the decennial average by 5·2 and ·15. Scotland gave admission and death ratios of 12·1 and ·34 per 1,000, showing an increase on the previous year's rates of 3·4 and ·34, and on the average rates of 3·6 and ·02. The ratios of admission and mortality for Ireland were 14·4 and ·29, showing an increase on the preceding year's rates of 6·2 and ·12, and on the average rates for the preceding ten years of 6·6 and ·07.

Amongst the admissions for diseases of the nervous system there were 332 admissions (with 5 deaths) for *mental diseases*, giving an admission rate of 2·5, or an increase on the previous year's rate of 1·2, and a similar increase

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on the decennial average rate. England and Wales gave a ratio of 2·3, as compared with 1·2 in 1899, and 1·2 the decennial average rate. Scotland, with a rate of 2·7, shows a fractional increase (·3) on the previous year, and an increase of 1·1 on the decennial rate; while Ireland, with a rate of 3·3, shows increase of 1·9 and 1·8 in these comparisons.

Excluding cases of mental disease, the principal causes of admission were:—neuralgia 474 cases; epilepsy 394; vertigo 155; paralysis 140; headache and megrim 65; neuritis 51; diseases of the brain and spinal cord 81; nervous weakness 43; chorea 21; hysteria 21.

Including mental disorders, the deaths were recorded under inflammation of brain and its membranes 25 cases; apoplexy 9 cases; epilepsy 8; abscess of brain 4; degeneration of spinal cord 3; hæmorrhage of brain, mania, and hemiplegia 2 cases each; neuritis, paralysis, chorea, softening of brain, dementia, delusional insanity, and general paralysis of insane 1 case each.

Diseases of the Eye were the cause of 1,909 admissions, equal to a ratio of 14·4 per 1,000, or an increase on the previous year's rate of 2·9, and on the average rate for the preceding ten years of 3·4. England and Wales gave a ratio of 14·6 per 1,000, or above the preceding year's rate and that of the decennial average by 3·2 and 3·8 respectively. Scotland, with a ratio of 9·2 per 1,000, shows an advance on the previous year's rate of ·3, and on the decennial rate of ·7. For Ireland the ratio was 15·0 per 1,000, or higher than the ratio for 1899 and the decennial average rate by 2·5 and 4·2 respectively. The causes of admission were conjunctivitis 1,095 cases, affections of the cornea 149, myopia 142, iritis 123, and various other affections of the eye 400 cases.

Diseases of other Organs of Special Sense caused 1,214 admissions, equal to a ratio of 9·1 per 1,000, which shows a decrease, as compared with the ratio given in the preceding year, of ·6, but an increase in comparison with the decennial average rate of ·6. England and Wales gave a ratio of 10·1 per 1,000, being slightly below (·3) that given in 1899, but above the average rate for the preceding ten years by 1·1. Scotland, with a ratio of 2·6 per 1,000, shows a decline in both comparisons of 1·4 and 2·4 respectively. The ratio for Ireland was 7·4 per 1,000, and shows a decline in comparison with the rate for 1899 of ·6, but is practically the same as the average rate. Of the total admissions 732 were for inflammation of the external meatus, 209 for deafness, and 214 for diseases of the middle ear, including 95 cases of perforation of membrana tympani. There were 45 admissions for nasal affections, including 25 for epistaxis and 15 for rhinitis. Three deaths occurred from inflammation of middle ear.

Diseases of the Circulatory System caused 2,185 admissions and 100 deaths, the equivalent ratios being 16·4 and ·65 per 1,000, both of which are higher than the corresponding ratios in the previous year by 5·2 and ·28, and than those of the decennial average by 6·3 and ·30 per 1,000 respectively.

These diseases show the following comparisons in the three divisions of the United Kingdom:—

	Ratio per 1,000 of strength.					
	Admissions.			Deaths.		
	1900.	1899.	1890–99.	1900.	1899.	1890–99.
England and Wales	17·3	11·6	10·1	·72	·39	·36
Scotland	7·8	5·9	7·7	·34	·92	·45
Ireland	15·6	10·7	10·4	·45	·17	·30

The chief causes of admission were disordered action of the heart 823 cases, valvular disease of the heart 749 cases, varix 426, and phlebitis 46 cases. The causes of death were valvular disease of the heart (40), aneurysm (18) (of which 12 were for aneurysm of heart), syncope (17), degeneration of the heart (9), pericarditis (4), endocarditis (3), dilatation of heart (2), adherent pericardium (1), rupture of heart (1), rupture of aorta (1), degeneration of arch of aorta (1), hypertrophy of heart (1), arteritis (1), and embolism (1). *United Kingdom.*

Diseases of the Respiratory System caused 8,016 admissions and 372 deaths, the respective ratios being 60·3 and 2·41 per 1,000, both being higher than the previous year's ratios by 6·2 and 1·47, and than the decennial average rates by 3·0 and 1·37 per 1,000 respectively.

The comparisons in the three divisions are as follows :—

	Ratio per 1,000 of strength.					
	Admissions.			Deaths.		
	1900.	1899.	1890-99.	1900.	1899.	1890-99.
England and Wales	60·3	56·2	58·0	2·59	·99	1·09
Scotland	40·6	51·0	50·4	1·84	1·85	1·17
Ireland	66·0	47·8	56·0	1·88	·64	·90

For bronchial affections there were 5,425 admissions, while pneumonia contributed 1,268, pleurisy 601, laryngitis 209, phthisis 190, and spasmodic asthma 97 admissions.

The deaths were due to pneumonia (300), phthisis (21), bronchitis (20), pleurisy (10), hæmoptysis (5), broncho-pneumonia (4), empyema (4), laryngitis (3), spasmodic asthma (2), congestion of lung (2) and emphysema (1).

The increased prevalence of, and mortality from, pneumonia is generally attributed to the condition of the re-enlisted old soldiers forming the Royal Reserve and to the Embodied Militia. Numbers of these were previously in bad health and addicted to alcoholic excess, and contracted the disease by exposure while under the influence of drink. The poor physique of the recruits is also cited.

Diseases of the Digestive System were the cause of 13,269 admissions and 57 deaths, the equivalent ratios being 99·8 and ·37 per 1,000, showing a decrease in the rate of admission of 14·2, but an increase in that of mortality of ·09 as compared with the previous year, and a decrease of 7·3 and an increase of ·08 respectively in comparison with the average ratios for the preceding ten years.

The comparisons in the three divisions are as follows :—

	Ratio per 1,000 of strength.					
	Admissions.			Deaths.		
	1900.	1899.	1890-99.	1900.	1899.	1890-99.
England and Wales	104·9	123·6	112·5	·37	·34	·30
Scotland	52·5	77·1	84·6	·46	·46	·32
Ireland	94·6	88·7	93·3	·36	·04	·26

Among the cases were 8,772 admissions for affections of the mouth and throat, 1,399 for indigestion, 618 for diarrhœa, 556 for hernia, 454 for piles, colic 395, hepatic diseases 372 (including 136 cases of jaundice, 43 congestion of liver and 9 abscess of liver) and 140 for inflammation of intestines.

The deaths were from peritonitis (11), ulceration of stomach (9), hepatitis (6), abscess of liver (6), inflammation of stomach (5), ulceration of intestines (2), intussusception (2), cirrhosis of liver (2), intestinal obstruction (2), dropsy (2), enteritis (2), hæmatemesis (1), typhlitis (1), colitis (1), volvulus (1), diarrhœa (1), congestion of liver (1), jaundice (1) and rupture of intestines (1).

Diseases of the Lymphatic System caused 860 admissions and 1 death, equal to ratios of 6·5 and ·01 per 1,000 respectively. The admission rate shows a decrease as compared with the rate given in 1899 of 1·5 and in comparison with the ten years' average rate of 6·2.

The admission rate in England and Wales was 6·6 per 1,000, or below the previous year's rate by 1·9 and that of the decennial average by 6·9. Scotland, with an admission rate of 3·0, shows a decrease as compared with the previous year of 5·2 and in comparison with the decennial average rate of 4·2. The admission rate for Ireland was 7·0 per 1,000, which is higher than that in the previous year by ·7, but lower than the average rate by 4·1. The majority of the admissions were for inflammation and suppuration of the glands; but there were also 13 cases of goitre and 10 of splenitis. The death was due to splenitis.

Diseases of the Urinary System gave 463 admissions and 18 deaths, equal to ratios of 3·5 and ·12 per 1,000, which, compared with the ratios in the previous year, show an increase of 1·1 in the former and ·02 in the latter, and, in comparison with the decennial average rate the admission rate shows an increase of 1·2, but the mortality rate a fractional decrease (·01).

The comparisons in the three divisions are as follows:—

Ratio per 1,000 of strength.

	Admissions.			Deaths.		
	1900.	1899.	1890-99.	1900.	1899.	1890-99.
England and Wales	3·7	2·4	2·2	·12	·12	·14
Scotland	2·5	1·6	2·2	·12	—	·03
Ireland	3·1	2·7	2·3	·10	·09	·11

The majority of the admissions were due to incontinence of urine, 194 cases; Bright's disease, 99; acute nephritis, 60; hæmaturia and cystitis, 30 cases each; irritability of bladder, 12; and retention of urine 10 cases.

Of the deaths, 15 were due to Bright's disease and 3 to acute nephritis.

Diseases of the Generative System.—Under this heading are recorded 2,861 admissions, including 976 for soft chancre (already referred to under the heading of venereal diseases), equal to a ratio of 21·5 per 1,000, which is lower than the rate in 1899 by ·9, and than that of the decennial average by 6·1. For England and Wales the ratio was 22·3, which is above that of the preceding year by ·6, but below the average rate by 5·7. Scotland with a rate of 12·9 per 1,000, shows a decrease as compared with the previous year's and the average rates of 9·7 and 15·1 respectively. In Ireland the admission rate was 20·9, being lower than the rate in the previous year by 3·8, and than the decennial average by 5·2 per 1,000. There was 1 death from stricture of urethra.

Diseases of the Organs of Locomotion gave 1,806 admissions with 3 deaths. The admission ratio, 13·6 per 1,000, is exactly similar to that given in the preceding year, but is higher than the decennial average rate by 3·4. *United Kingdom.*

England and Wales gave an admission rate of 13·8 per 1,000, which shows a slight decrease (·3) as compared with the rate in the previous year, but in comparison with the decennial average rate an increase of 3·9 is observed. In Scotland the rate of admission was 7·6, being below the previous year's rate and that of the decennial average by 3·7 and 2·6 respectively. Ireland gave a ratio of 14·4, which is higher in both comparisons by 1·9 and 3·6 respectively. The deaths were due to inflammation of bones, inflammation of joints and lumbar abscess.

Diseases of the Connective Tissue were the cause of 3,388 admissions, giving a ratio of 25·5 per 1,000, which, compared with the rate given in the previous year, shows a decrease of 1·0, but in comparison with the decennial average rate an increase of 1·1. The admission rate in England and Wales, 26·4 per 1,000, is fractionally below (·2) the previous year's rate, but above the average rate for the preceding ten years by 2·3. Scotland, with a ratio of 18·2 per 1,000, shows a decrease as compared the previous year's rate and that of the decennial average of 6·5 and 9·8 respectively. Ireland gave a ratio of 24·2 per 1,000, showing a decrease on the previous year's rate of 2·2, and on that of the decennial average of ·4 Of the admissions, 2,237 are returned as abscess and 1,133 as inflammation of the connective tissue.

Diseases of the Skin caused 6,037 admissions, or a ratio of 45·4 per 1,000, which is below the previous year's rate and that of the decennial average by 7·8 and 2·4 respectively.

The admission rates for the three divisions are as follows :—

	Ratio per 1,000 of strength.		
	1900.	1899.	1890–99.
England and Wales	43·8	51·7	46·9
Scotland	39·3	48·7	50·7
Ireland	53·3	59·0	50·1

The chief causes of admission were boils 1,619, ulcer 1,361, eczema 1,215, whitlow and onychia together 745, herpes 230, and psoriasis 213 cases. One fatal case occurred, due to pemphigus.

INJURIES.—For injuries of all kinds there were 11,968 admissions to hospital and 115 deaths, the equivalent ratios per 1,000 being 90·0 and ·74. The admission rate shows a decrease as compared with the previous year's rate and that of the average of 15·8 and 12·4 respectively, but the death rate shows a slight advance (·03 and ·08) in these comparisons. For *general injuries* there were 191 admissions and 59 deaths, as compared with 115 admissions and 42 deaths in the previous year; their ratios, however, show but a fractional change. Heat-stroke, sun-stroke and heat-apoplexy caused 133 admissions, multiple injury 23, burns and scalds 16, exhaustion 8, suffocation from submersion 5, lightning-stroke 4, and shock 2. Of the cases of sun-stroke, heat-stroke, and heat-apoplexy 69 occurred at Aldershot, 14 in the Thames district, 11 in the Eastern, 8 in the Southern, 8 in the South-Eastern, 6 in the Western, 4 each in the Salisbury Plain and Home districts, 3 in the Cork, 2 in the Woolwich, and 1 each in the North-Eastern, North-Western, Scottish and Curragh districts. In Aldershot all of the admissions occurred in connection with a field day, a sudden increase of

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to injury in taking place during the operations, which were of a protracted and laborious character.

Five cases of lightning-stroke occurred in Salisbury Plain district.

The deaths were 37 from submersion (drowning), 11 from multiple injury, 4 from sun-stroke, 4 from heat-apoplexy, and 1 each from suffocation from strangulation, suffocation from plugging of the air passages, and shock.

The deaths from drowning by districts were:—Southern 8, Western 4, Belfast 5, North-Western 3, Channel Islands 3, Scottish 3, Cork 3, Thames 2, South-Eastern 2, North-Eastern 1, Home 1, Woolwich 1, and Aldershot 1. Two of the cases were returned as suicidal, in one there was no evidence to show whether of sound mind or not, in twelve instances the verdict "accidentally drowned" was given, and in seven "found drowned." In two cases, one of which occurred in Cork Harbour and the other in the Firth of Forth, it is recorded that the bodies were not recovered, and in the remaining cases no verdict has been furnished.

The deaths from multiple injury numbered 11, of which 5 were the result of accidents on the railway, 2 were caused by falls from a height (suicidal), 1 each, through being run over by a traction engine and a wagon respectively, 1 from the explosion of a magazine caused by the man firing his carbine down the ventilating shaft (suicidal), and 1 the cause of which was not furnished.

At Aldershot 4 deaths occurred from sun-stroke; heat-apoplexy caused 2 deaths at Woolwich and 1 each at Lydd and Great Yarmouth.

A case of suffocation occurred at Edinburgh Castle in a man who was on guard, due to plugging of the air passages with matter vomited from the stomach.

Local Injuries were the cause of 11,465 admissions and 56 deaths, as compared with 10,443 admissions and 32 deaths in the previous year. The most frequent causes of admission were wounds 3,384, sprains 2,724, contusions 2,744, injuries of feet 817, fractures 780, and abrasions 487. The deaths were 15 from fracture of skull, 14 from wound of neck, 12 from gunshot wound, 4 from concussion of brain, 3 each from wound, fracture of spine, and rupture of bladder, and one each from contusion and dislocation of neck.

Of the deaths from gunshot wound 11 were suicidal and 1 accidental, and all the deaths from wound of neck were suicidal. The remaining deaths were due to accidents.

Poisons. Under this head 32 admissions and 5 deaths are recorded; of this number 11 admissions are shown as lead poisoning, 4 as due to the eating of poisonous fungi, all of which occurred among the troops at Salisbury Plain, 4 poisoned wounds, 3 chloroform vapour (fatal), 3 opium, 2 each from tobacco and ptomaine poisoning, and 1 each from strychnine, iodine, and snake bite.

In addition to the above, 2 deaths occurred out of hospital in which the nature of the poison is not defined.

Suicide. There were 28 cases in the year under report as compared with 24 in 1900 and 24 the average for the ten preceding years. Twenty-two occurred in England and Wales, 2 in Scotland, and 4 in Ireland. The mode of suicide was wound of throat (11 cases), gunshot wound (11), suffocation by submersion (1), multiple injury (2), and wound of the food passages from within caused by forcing a table-spoon into the œsophagus (1). In 20 of the cases only were verdicts of temporary insanity given. In none of the cases was the motive recorded.

Surgical Operations. Exclusive of the operations performed at the Army Medical School, Netley, and tabulated in Appendix II of this Report, the surgical operations necessitated by the various cases admitted to military hospitals in the United Kingdom during the year was above that in the previous year. Following the classification given in the official nomenclature of diseases, the following indicates the number of operations under the several headings:—

Removal of tumours, 10; of cysts, 4; evacuation of abscesses, 19; removal of foreign bodies, 6; for aneurysm, 2; on veins, 19; for hæmorrhage, 1; on lymphatic glands, 9; on nerves, 1; on skin and subcutaneous tissue, 16; operations on bones, 19; on joints, 16; on muscles and tendons, 3; amputations, 44; on skull and brain, 3; on face, nasal cavities and mouth, 4; operations on appendages of eye, 8; excision of eyeball, 7; operations on ear, 4; on larynx, 3; operations on thorax and breast, 27; on abdomen, 70; on rectum and anus, 29; on bladder and urethra, 8; and on male genital organs, 100. *United Kingdom.*

Many of these operations call for no special remark. Nearly all the operations on veins were for the cure of varix or varicocele by excision or ligature. The operations on bones were principally operations for fracture, removal of necrosed bone, osteotomy, rectifying faulty union due to fracture, and breaking down of adhesions. The operations on joints were mainly for reduction of dislocation, breaking down of adhesions, and operations on joints on account of deformity and disease. The cases of amputation were 3 of thigh, 4 of leg, 1 of arm, 23 of toes and 13 of fingers. The operations on skull and brain were all cases of trephining. On the face, nasal cavities and mouth, the operations were 2 each for removal of tonsils, and opening and draining antrum for abscess of jaw. There were 7 cases of excision of eyeball on account of injury or disease. Under operations on larynx and thyroid body there were 2 of tracheotomy and 1 of laryngotomy. All the operations on the thorax and breast, with one exception, a case of abscess of lung, were connected with pleurisy or empyema. The operations on the abdomen were in the majority of instances for the radical cure of hernia, there were 10 operations for abscess of liver, there was also an operation (appendisectomy) for typhlitis, one of laparotomy for peritonitis, one of tapping of the abdomen for dropsy, one of nephro-lithotomy for calculus, one of nephrotomy for perinephritic abscess, and an operation for hydronephrosis of left kidney. The operations on the rectum and anus included 15 for ligature and removal of piles, 10 for fistula in ano, 2 for excision of non-malignant new growth, and 1 each for fissure of anus and ischio-rectal abscess. Among the operations on bladder and urethra were 6 for stricture, and 1 case each for exploration of bladder for stone, and suture of rent in bladder. Operations on the male genital organs included 89 of circumcision, 5 for hydrocele, 4 for removal of testicle and 1 each for varicocele and incision of penis on account of gangrene. Recovery resulted in all except 21 cases, namely, 4 after operation for abscess of liver, in one of which pneumonia supervened; 3 after operations for empyema, in one of which the patient died in a fit three days after the operation; 2 after trephining was performed; 2 after operations on knee joint for tubercle; and 1 each following amputation of thigh, tracheotomy on account of wound of neck, operation for dropsy, for aneurysm, suture of rent in bladder, removal of cyst, and operations on account of lumbar and mastoid abscesses. Two deaths occurred from poisoning by chloroform vapour during operations for varicocele and removal of bullet respectively.

The anæsthetic principally used was chloroform; ether was also employed, but not to any considerable extent, while cocaine was used only in a few minor instances.

INVALIDING.—The number of men discharged the service in the course of the year on account of medical unfitness for further service was 5,074,* giving a ratio of 32·85 per 1,000, which is higher than in the previous year by 14·73, and than the average for the preceding ten years by 15·65 per 1,000.

* Included in this number are the cases of 475 men who had returned from the South African Field Force, and who had reverted to duty at home, but whose disabilities were attributed to service in the campaign. The full statistics of men invalided direct from the South African Field Force are reserved for record at the conclusion of the war.

United Kingdom.

There were 4,190 men invalided in England and Wales, equal to a ratio of 36·48 per 1,000, which is higher than in the previous year by 17·00, and than the decennial average rate by 18·83. In Scotland, 102 men were discharged, giving a ratio of 11·72 per 1,000, which shows an increase on that of the previous year of 2·26, but a decrease as compared with that of the average of 4·01. The men discharged in Ireland numbered 782, giving a ratio of 25·30 per 1,000, which is above the rate in the previous year by 9·97, and that of the decennial average by 9·20 per 1,000.

The principal causes of invaliding were, as in previous years, diseases of the circulatory system, for which 1,025 men were discharged (including 500 for valvular disease and 198 for disordered action of the heart), the ratio per 1,000 being 6·63, or 2·92 above that of the previous year and 2·96 above the average. Next in frequency were injuries, which were the cause of 571 men being discharged (amongst which 252 were for injuries received in action), equal to a ratio of 3·70 per 1,000, which is higher than the previous year's rate by 2·69, and than the decennial average rate by 2·88. For nervous diseases 540 men were discharged the service, equal to a ratio of 3·49 per 1,000, or higher than in the previous year by 1·09, and than the decennial average rate by 1·42 per 1,000. Among the cases were 212 of mental affection, giving a ratio of 1·37 per 1,000, which is an increase on the preceding year's rate of ·39 and on that of the decennial average of ·46.

Diseases of the organs of locomotion caused the discharge of 374 men, the ratio, 2·42 per 1,000, being higher than in the previous year by ·85, and than the average rate by 1·09. Digestive disorders caused the discharge of 373 men, or a ratio of 2·41 per 1,000, showing an increase as compared with the previous year's rate of 1·45, and above that of the decennial average by 1·31 per 1,000.

Diseases of the eye were the cause of 339 men being discharged, the equivalent ratio being 2·19 per 1,000, which is an advance of 1·09 and 1·42 per 1,000 respectively on the previous year's and decennial average rates. The chief causes of discharge were ametropia, conjunctivitis, keratitis, and cataract. Debility accounted for the discharge of 313 men, the ratio being 2·03 per 1,000, which is above the rate in 1899 by 1·27 and that of the decennial average by 1·18 per 1,000. The number of men discharged for respiratory diseases was 283, or a ratio of 1·83 per 1,000, and exceeds that of the previous year by 1·13 and that of the average by 1·10 per 1,000, Tubercular diseases caused the discharge of 280 men, the ratio, 1·81 per 1,000, being ·39 above the rate given in the previous year, and ·06 above the average. Of the above number, tubercle of lung caused 258 discharges. Under rheumatism 255 men are shown as having been discharged, the ratio, 1·65 per 1,000, being higher than the rate in the previous year and that of the decennial average by ·91 and 1·00 per 1,000 respectively.

Diseases of the organs of special sense, excluding ophthalmic affections, caused the discharge of 162 men, equal to a ratio of 1·05 per 1,000, which is exactly equal to the previous year's rate and fractionally above (·02) the decennial average rate. The discharges under this head were chiefly due to perforation of the membrana tympani and deafness. Under secondary syphilis 126 men are shown as being discharged, equal to a ratio of ·82 per 1,000, which is below the previous year's rate and that of the decennial average by ·24 and ·13 per 1,000 respectively.

The invaliding rates for other diseases are, with a few exceptions, similar to those of 1899, and call for no special remark.

Health Statistics according to Age.

The following table has been prepared to show the influence of age on ickness, mortality, and invaliding among the troops serving in the United ingdom during the year :—

United Kingdom.

Ages.	Average Strength.	Admissions.	Deaths.	Invalided.	Ratio per 1,000 of Strength.		
					Admissions.	Mortality.	Invaliding.
Under 20 years	38,484	27,762	138	812	721·3	3·59	21·10
From 20 to 25 years ...	36,075	31,694	225	1,479	878·6	6·24	40·99
,, 25 ,, 30 ,, ...	22,049	11,800	146	1,001	535·2	6·62	45·40
,, 30 ,, 35 ,, ...	15,172	6,729	170	730	443·5	11·21	48·12
,, 35 ,, 40 ,, ...	12,372	5,243	179	513	423·8	14·47	41·46
40 years and upwards ...	6,659	3,813	155	539	577·1	23·28	80·94
Not classified	2,110	7	10	—	3·3	4·74	—
Total	132,921	87,078	1,023	5,074	665·1	*6·62	*32·85

* Calculated on strength including men detached (154,464).

The admission rate, as in the previous year, was highest, 878·6 per 1,000, among men between 20 and 25 years of age, the next highest being 721·3 per 1,000 among men under 20 years of age, the next highest among men of 40 years and upwards with 577·1, followed by men between 25 and 30 years with 535·2, then by men between 30 and 35 years of age 443·5, the lowest admission rate being 423·8 among men between 35 and 40 years of age.

The mortality rate, as in the four preceding years, was lowest, 3·59 per 1,000, among men under 20 years of age, steadily increasing through each quinquennial period to 23·28 among men of 40 years of age and upwards. In 1899 the highest death rate was also among men of 40 years of age and upwards, viz., 15·86 per 1,000. The highest rate of invaliding, 80·94 per 1,000, was among men of 40 years and upwards, the next highest ratio being 48·12 per 1,000 among men between 30 and 35 years of age, followed by 45·40 per 1,000 among men between 25 and 30 years, 41·46 among men between 35 and 40 years, 40·99 among those between 20 and 25 years, and 21·10 among men under 20 years of age. The highest rate of invaliding in 1899, 25·07 per 1,000, was among men between 20 and 25 years of age.

Health Statistics according to Length of Service.

The following table shows the influence of length of service on the various rates :—

Service.	Average Strength.	Admissions.	Deaths.	Invalided.	Ratio per 1,000 of Strength.		
					Admissions.	Mortality.	Invaliding.
Under 1 year	52,781	39,614	331	1,432	750·5	6·27	27·13
From 1 to 2 years ...	19,979	13,011	70	557	651·2	3·50	27·88
,, 2 ,, 3 ,, ...	10,818	6,967	42	337	644·3	3·88	31·17
,, 3 ,, 4 ,, ...	8,935	4,869	36	267	544·9	4·03	29·88
,, 4 ,, 5 ,, ...	8,341	3,539	41	236	424·3	4·92	28·29
,, 5 ,, 10 ,, ...	13,436	9,386	160	963	698·6	11·91	71·67
10 years and upwards ...	16,526	9,685	327	1,282	586·1	19·79	77·58
Not classified	2,110	7	16	—	3·3	7·58	—
Total	132,921	87,078	1,023	5,074	665·1	*6·62	*32·85

* Calculated on strength including men detached (154,464).

United Kingdom.

The highest admission rate was 750·5 per 1,000 among men under 1 year's service, and the lowest ratio 424·3 per 1,000 among men between 4 and 5 years' service. The sequence of ratios closely resembles that in the previous year, but the highest ratio is lower than in the previous year by 175·9.

As in the previous year, the mortality was highest among men with 10 years' service and upwards, 19·79 per 1,000, but the lowest, 3·50 per 1,000, was among men between 1 and 2 years' service. The second highest, as was also the case in the preceding year, occurred in men of from 5 to 10 years' service, the ratio being 11·91 per 1,000.

Invaliding was highest among men with upwards of 10 years' service, the ratio being 77·58 per 1,000, followed closely by men having between 5 and 10 years' service with 71·67. The lowest rate, 27·13, was among men with less than 1 year's service. In the previous year the highest rate, 23·09 per 1,000, occurred among men with from 5 to 10 years' service, and the lowest, 12·01, in men of 4 to 5 years' service.

Health Statistics according to Districts.

The admissions, deaths, invalids discharged the service, average number constantly sick, average sick time to each soldier, and average duration of each case of sickness in the various military districts are shown in the following table (p. 27).

It will be observed that the highest *rate of admission* occurred in the Dublin district with 900·5 per 1,000, followed by the Aldershot district with 825·8. The lowest ratio was in the Scottish district with 445·4, the next lowest being in the Salisbury Plain district with 481·1, and the Channel Islands with 549·5. In 1899 the highest ratio was in the Home district, followed by the Dublin district. Compared with the previous year's admission rates, increase has occurred in the South-Eastern district, Dublin, Cork, Channel Islands, Aldershot, and Thames districts, to the extent of 118·5, 97·3, 90·2, 86·9, 86·6 and 38·5 respectively, while decrease is observed in all other districts, the most prominent being the Woolwich, Eastern, Home, Southern, Scottish and Curragh districts with 167·4, 136·6, 121·8, 105·7, 78·7, and 70·3 respectively.

The highest *death rate* is shown in the Woolwich district, 11·71, followed by the North-Western, Southern, Thames, Aldershot and Belfast districts with 10·41, 10·04, 8·98, 8·77, and 7·70 per 1,000. In the previous year the highest death rates were in the Scottish, North-Western, North-Eastern, and Western districts. The lowest death rates are observed in the Salisbury Plain, Dublin, Curragh, Eastern and Western districts with 3·59, 5·43, 5·60, 6·09 and 6·13 per 1,000. In the previous year the lowest rates occurred in the Belfast, Curragh, Eastern, and Dublin districts. In comparison with the rates in the previous year only one district, the Scottish, shows decrease. The districts which show the most marked increase are Woolwich with 7·34, Belfast 5·31, Southern 4·96, North-Western 4·89, Thames 4·62, and Aldershot 4·40 per 1,000 respectively.

With regard to *invaliding*, the highest ratios were in the Aldershot, Home, Western, Belfast and Dublin districts, with 81·39, 50·17, 47·98, 40·91 and 35·99 per 1,000. The lowest rates occurred in the Scottish, Thames, Cork and Channel Islands districts with 13·18, 14·43, 16·60 and 17·44. Compared with the previous year, the year under report shows increase in all the districts, the greatest being in the Aldershot district with 57·19, followed by the Belfast, Western, South-Eastern, Curragh and Home districts, with 24·71, 23·66, 21·66, 20·19 and 17·77 per 1,000.

The ratio of *constantly sick* was highest in the Dublin district with 47·37, followed by the Aldershot, Home, Woolwich, Curragh and Western districts with 45·47, 44·46, 40·40, 35·31, and 34·06 per 1,000 respectively, while the lowest rates occurred in the Salisbury Plain, Scottish, North-Western, Thames and Eastern districts with 14·62, 19·99, 23·87, 28·55 and 29·01 per 1,000. In comparison with the rates given in the previous year, increase has occurred in the Channel Islands, South-Eastern, Aldershot, Cork and Thames districts, while all the remaining districts show decrease.

The *average sick time to each soldier* was highest in the Dublin district with 17·29 days, followed by 16·60 in Aldershot, 16·23 in the Home, 14·74

Military Districts.	Average Annual Strength.	Admissions into Hospital.	Deaths.			Invalids discharged the Service.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.
			With the Regiment.	Absent from the Regiment.	Total.			Admitted into Hospital.	Died.	Invalids discharged the Service.	Constantly Sick.		
												days.	days.
1. North-Eastern	7,074	4,415	43	2	45	187	224·69	624·1	6·36	26·43	31·76	11·59	18·57
2. North-Western	6,338	3,641	65	1	66	160	151·30	574·5	10·41	25·24	23·87	8·71	15·16
3. Eastern...	7,719	4,866	42	5	47	173	223·89	620·7	6·09	22·41	29·01	10·59	16·79
4. Western	9,795	6,077	56	4	60	471	333·65	620·4	6·13	47·98	34·06	12·43	20·04
5 Southern	11,657	6,756	102	15	117	389	392·89	579·5	10·04	33·37	33·71	12·30	21·23
6. Thames...	6,793	4,017	49	12	61	98	193·94	591·3	8·98	14·43	28·55	10·43	17·62
7. South-Eastern	10,460	7,161	58	10	68	339	329·06	684·6	6·50	32·41	31·46	11·48	16·77
8. Home	8,032	6,065	57	2	59	403	357·09	755·1	7·35	50·17	44·46	16·23	21·49
9. Woolwich	5,210	3,142	42	19	61	154	210·48	603·1	11·71	29·56	40·40	14·74	24·45
10. Aldershot	21,206	17,511	178	8	186	1,726	964·35	825·8	8·77	81·39	45·47	16·60	20·10
11. Channel Islands	1,376	756	10	—	10	24	39·63	549·5	7·27	17·44	29·80	10·51	19·13
12. Salisbury Plain	3,068	1,476	11	—	11	66	44·86	481·1	3·59	21·51	14·62	5·34	11·09
13. Scottish	7,736	3,446	53	4	57	102	154·66	445·4	7·37	13·18	19·99	7·30	16·38
14. Belfast	4,938	2,947	33	5	38	202	155·59	596·7	7·70	40·91	31·51	11·50	19·27
15. Dublin	7,002	6,305	37	1	38	252	331·68	900·5	5·43	35·99	47·37	17·29	19·20
16. Cork	9,700	5,570	69	3	72	161	286·16	574·2	7·42	16·60	29·50	10·77	18·75
17. Curragh	4,817	2,925	25	2	27	167	170·09	607·2	5·60	34·67	35·31	12·89	21·23
Total	132,921	87,078	930	93	1,023	5,074	4,564·01	655·1	*6·62	*32·85	24·34	12·53	19·13
Average of 10 years, 1890 to 1899	991,820	700,716	4,045	316	4,361	17,470	40,358·22	706·5	*4·29	*17·20	40·69	14·85	21·02

* These ratios are calculated on a strength including men detached.

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in the Woolwich, 12·89 in the Curragh and 12·43 in the Western districts. The lowest sick time was in the Salisbury Plain district with 5·34, followed by the Scottish, North-Western, Thames and Channel Islands with 7·30, 8·71, 10·43, and 10·51 days respectively. Increase is observed in the Channel Islands, South-Eastern, Aldershot, Cork and Thames districts, but in all the remaining districts decrease occurred.

For the *average duration* of each case of sickness the highest figures are shown in the Woolwich, Home, Curragh, Aldershot and Western districts, with 24·45, 21·49, 21·23, 20·10 and 20·04 days respectively; the lowest periods being shown in the Salisbury Plain, North-Western, Scottish, South-Eastern, Eastern and Thames districts with 11·09, 15·16, 16·38, 16·77, 16·79, and 17·62 days. Compared with the figures of the preceding year, increase is observed in the Home, Curragh, Woolwich, North-Eastern, Channel Islands and Belfast districts, but in all the others decrease is shown.

Health Statistics according to Arms of the Service.

The following table, compiled from the returns of principal medical officers, shows the admissions, deaths, number of men invalided, and number constantly sick, from each arm of the service, with the ratios per 1,000 of the strength, and the corresponding ratios for the previous ten years :—

Arms of the Service.	Average Strength.	Admitted into Hospital.	Died.	Discharged as Invalids.	Average Number constantly Sick.	Annual Ratio per 1,000 of Strength.				Average Ratio per 1,000 for the 10 Years, 1890–99.			
						Admitted.	Died.	Invalided.	Constantly Sick.	Admitted.	Died.	Invalided.	Constantly Sick.
Household Cavalry ...	826	550	2	14	31·88	665·9	2·42	16·95	38·60	657·2	3·16	22·22	34·63
Cavalry	11,511	8,723	54	371	471·37	757·8	4·69	32·23	40·95	783·2	3·91	18·47	44·84
Royal Artillery ...	21,304	13,437	160	596	685·16	631·8	8·32	29·35	33·74	611·4	5·02	15·65	38·65
Royal Engineers ...	4,139	1,922	39	85	141·92	464·4	9·42	20·54	24·62	426·2	4·96	9·36	21·94
Foot Guards	4,882	4,015	30	303	243·72	822·4	6·15	62·06	49·92	819·1	4·75	25·91	62·78
Infantry	33,182	22,997	282	1,756	1,285·80	693·1	8·50	52·92	38·75	805·7	3·79	20·88	46·56
Regimental Depôts ...	14,281	9,772	129	401	452·22	684·3	9·03	28·08	31·66	621·7	5·53	11·54	25·35
Garrison Staff and Departments.	4,505	2,013	48	118	156·65	446·7	10·65	32·84	34·76	389·3	4·90	9·58	24·67
Embodied Militia ...	38,912	23,473	263	1,397	1,130·16	603·2	6·76	35·90	29·14	—	—	—	—
Yeomanry	198	115	1	1	2·75	580·8	5·05	5·05	13·90	—	—	—	—
Enlisted Volunteers	18	61	6	2	2·38	438·9	33·33	11·11	13·22	—	—	—	—

The highest rate of admission in any arm of the service was 822·4 per 1,000 in the Foot Guards, the Cavalry coming next with 757·8 per 1,000, and the lowest 446·7 in the Garrison Staff and Departments, the next lowest being 464·4 in the Royal Engineers. In the previous year the above arms of the service were in exactly the same order.

The mortality rate was highest in the Garrison Staff and Departments with 10·65 per 1,000, followed by the Royal Engineers with 9·42 per 1,000. In the previous year the highest rate was in the Regimental Depôts, the Foot Guards coming second. The lowest death rates in the year under review, as in the previous year, occurred in the Household Cavalry and Cavalry of the Line with 2·42 and 4·69.

Invaliding was highest in the Foot Guards, with a ratio of 62·06 per 1,000, Infantry Regiments coming next with 52·92 per 1,000; while the lowest rates occurred in the Household Cavalry and Royal Engineers with 16·95 and 20·54 per 1,000 respectively. In the previous year, as in the year under report,

the Foot Guards and Infantry Regiments stood highest, but the Garrison Staff and Departments occupied the lowest position, followed by the Royal Engineers. *United Kingdom.*

The highest rate of constant inefficiency from sickness was in the Foot Guards with 49·92 per 1,000, the next being 40·95 per 1,000 in the Cavalry. The lowest rate was in the Royal Engineers with 24·62, Regimental Depôts coming next with 31·66 per 1,000. In the preceding year the above arms of the service occupied exactly the same positions as in the year under review.

As compared with the admission rates for the previous year, decrease is observed in the Household Cavalry, Cavalry, Foot Guards and Infantry Regiments, but increase is observed in all other arms of the service. The mortality rate has increased in every arm of the service, and the invaliding rate shows only one instance of decrease, viz., the Household Cavalry. In comparing the ratios of the year under report with those of the preceding ten years, that of admission shows a decrease in the Cavalry and Infantry Regiments, but all other arms of the service show increase. In only one instance has a decline taken place, in the rate of mortality, that of the Household Cavalry, and the only decrease in the invaliding rate occurred in the same arm. The ratio of constant inefficiency though sickness has decreased in the Cavalry, Royal Artillery, Foot Guards and Infantry Regiments, while in all other arms it has increased.*

In Abstract XXVIII will be found a table showing the general health of individual corps serving in the United Kingdom during the year.

Officers, Women and Children.

The principal statistics of sickness and mortality amongst officers, women and children, according to the several sections of disease, are shown in Abstract D, compiled from the Annual Returns of Principal Medical Officers of Districts.

Officers.

The average strength is given as 3,996, the number of admissions 1,329, and the number of deaths 16. The ratio of admission was therefore 332·6 and the ratio of mortality 4·00 per 1,000. Compared with the returns for the previous year there is an increase of 13·8 in the sick rate and a decrease of ·62 in the death rate.

General Diseases.—Forty-eight admissions are returned as *eruptive fevers*, being in the ratio of 12·0 per 1,000, which is higher than in 1899 by 5·7. The cases comprised 27 of measles, 10 of scarlet fever, 9 of rubella, and 2 of chicken-pox. *Influenza* caused 260 admissions (1 fatal), as compared with 285 admissions (1 fatal) in 1899. There were 5 cases of *enteric fever*, being in the ratio of 1·2 per 1,000, as compared with 2·2 in the preceding year. As in the previous year there was no death. The cases occurred as follows :—1 at Portsmouth, probably contracted in London on leave ; 1 at Shoeburyness—a mild case—for which no cause could be assigned ; 1 at Aldershot, probably contracted in, or on the voyage home from, South Africa ; 1 at Dublin, in which the sanitary condition of quarters in Ship Street Barracks, formerly occupied by this officer was stated to be unsatisfactory, although the defects were scarcely sufficient to definitely attribute the attack to them ; and 1 at Ballincollig, probably connected with an insanitarily constructed water closet in this officer's quarters. *Other continued fevers* caused 6 admissions or 1·5 per 1,000, which is lower by 4·5 than the corresponding rate in 1899. The cases comprised 5 of simple continued fever, and 1 of Mediterranean fever. There were 5 admissions for *dysentery*, the ratio, 1·2 per 1,000, being higher than the corresponding rate in 1899 by ·4. Twenty-six admissions for *malarial fevers* are returned, the ratio, 6·5 per 1,000, being below the corresponding rate in the previous year by 6·8 ; 24 of the cases were ague and 2 remittent fever. *Septic diseases* were represented by 2 cases of erysipelas and a fatal case of pyæmia. *Tubercular diseases* were unrepresented. There were 3 admissions

* Embodied Militia, enlisted Yeomanry and Volunteers, are not taken into account in these comparisons.

United Kingdom.

for venereal diseases, and for gonorrhœa as compared with 7 in 1899. No case of *parasitic disease* was returned. *Alcoholism* caused 1 admission. Under the head of *violence*, there were 44 admissions, being in the ratio of 4·10 per 1,000, which is higher than in the previous year by 1·4. The admissions included 1 case of rheumatic fever and 13 cases of gout. *Syphilis* caused 22 admissions as compared with 16 in the previous year. *Other general diseases* caused 12 admissions as compared with 4 in 1899. The cases comprised 7 of mumps, 2 of malignant new growth, 2 of anæmia, and 1 of non-malignant new growth. There were 2 deaths, both due to malignant new growth.

LOCAL DISEASES.—*Diseases of the Nervous System* caused 38 admissions, the principal causes of sickness being neuralgia 13 cases, and nervous weakness 11 cases. Two deaths occurred from meningitis, and one from apoplexy. There was no case of mental disease.

Diseases of the Organs of Special Sense gave a sick rate of 4·3 per 1,000, as compared with 3·8 in the previous year. Of the 17 cases giving this ratio, 9 were ophthalmic affections, 5 aural diseases, and 3 affections of the nose.

Diseases of the Circulatory System caused 15 admissions and 4 deaths, being in the ratios of 3·8 and 1·00 per 1,000 respectively, the former being higher by 1·4 and the latter by ·18 than the corresponding ratios in the previous year. Three of the deaths were due to valvular disease of the heart and one to syncope.

Diseases of the Respiratory System caused 218 admissions and 3 deaths, the ratios being 54·6 and ·75 per 1,000 respectively, the former being higher by 10·3, and the latter lower by ·61 than the corresponding ratios in the previous year. Of the cases 172 were bronchial affections, 16 laryngitis, 14 pneumonia, 8 spasmodic asthma, 4 pleurisy, and 2 each hay-fever and congestion of lung. The deaths were all due to pneumonia.

Diseases of the Digestive System caused 256 admissions, equal to a ratio of 64·1 per 1,000. Compared with the corresponding ratio for last year, an increase of 13·8 has occurred. The principal causes of sickness under this head were affections of the mouth and throat 120 cases, dyspepsia 27, diarrhœa 26, hepatic affections 23, inflammation of stomach 21, inflammation of intestines 16, colic 9, and piles 5 cases. There was no death.

Diseases of the Lymphatic System with 14 admissions gave a ratio of 3·5 per 1,000, as compared with 1·9 in 1899.

Diseases of the Urinary System were the cause of 12 admissions, the ratio, 3·0 per 1,000, being higher than in the previous year by 1·1.

Diseases of the Generative System gave a ratio of 3·3 per 1·000, as compared with 3·0 in the previous year. Of the 13 admissions 8 were due to orchitis.

Diseases of the Organs of Locomotion gave 51 admissions, 29 being due to synovitis and 13 to myalgia, the ratio, 12·8 per 1,000, showing a decrease of 2·1 as compared with the ratio in the previous year.

Diseases of the Connective Tissue with an admission ratio of 8·5 per 1,000, show an increase of ·3 as compared with the rate in 1899. Of the 34 admissions 23 were due to abscess and 11 to inflammation.

Diseases of the Skin gave a ratio of 10·3 per 1,000, as compared with 8·5 in 1899. Of the 41 admissions 9 were cases of boils, 7 eczema, 6 ulcer, 5 carbuncle, and 4 urticaria.

INJURIES were 183 in number, equal to a ratio of 45·8 per 1,000, a decrease of ·4 as compared with the rate in the previous year. The most common injuries were sprains, contusions, and wounds. Among the more serious injuries were 19 cases of fracture of bones, 2 of concussion of brain, 3 of dislocation of joints, and 1 of heat-stroke. Two deaths occurred, one from suffocation by submersion, caused by the capsizing of a boat in Milford Haven, and the other from fracture of spine with compression of cord, the result of an accident when out driving.

WOMEN.

The annual returns give the average strength of women borne on the strength of the army in the United Kingdom as 9,148. The number of cases of sickness, exclusive of uncomplicated cases of parturition, was 3,915, and the number of deaths 53. The ratio of sickness to strength was

428·0 per 1,000, and the ratio of mortality 5·79. Compared with the returns for the previous year there is an increase of 59·0 in the sick rate, and of 2·05 in the death rate. *United Kingdom.*

GENERAL DISEASES.—Thirty-six admissions, equal to a ratio of 3·9 per 1,000, are returned under the head of *eruptive fevers*. The ratio is slightly above the corresponding ratio in the previous year. The cases were 17 of measles, 10 of scarlet fever, 7 of rubella, and 2 of chicken-pox. *Influenza* caused 388 admissions, as compared with 458 in 1899. There were 5 cases of *diphtheria*, as compared with 4 in the previous year. The cases occurred at Colchester, Eastbourne, Lancaster, London, and Woolwich. *Enteric fever* caused 15 admissions and 1 death, being in the ratios of 1·6 and ·11 per 1,000 respectively, as compared with ·7 and ·18 in the previous year. The cases were distributed as follows:—2 at Dublin, in one of which some suspicion was attached to the milk supply, and in the other the patient had only occupied quarters a short time previous to attack, having previously lived in hired lodgings in the city; 1 at Shoeburyness (fatal), ascribed to eating shell-fish; 1 at Belfast, in which the cause was obscure, although the husband also had enteric fever; and 5 at Gosport, 2 at London, and 1 each at Devonport, Woolwich, Derby, and Shoeburyness, for which no definite cause is stated.

Other continued fevers caused 7 admissions and 1 death, equal to ratios of ·8 and ·11 per 1,000 respectively. In comparison with the previous year, in which there was no death, the admission rate is lower by 1·2. The cases comprised 6 of simple continued fever and a fatal case of cerebro-spinal fever. There were 7 cases of *dysentery*, the admission rate, ·8 per 1,000, being fractionally above that for the previous year. Twenty-four cases of *malarial fever* occurred, being in the ratio of 2·6 per 1,000, which is lower than the corresponding rate in the previous year by ·2. All the admissions were for ague. *Septic diseases* caused 25 admissions (1 fatal), equal to a ratio of 2·7 per 1,000, as compared with ·9 in the previous year. Of the cases, 19 were erysipelas, 4 septicæmia, and 2 pyæmia. The death was due to septicæmia. *Tubercular diseases* caused 39 admissions and 6 deaths, equal to ratios of 4·3 and ·65 per 1,000 respectively, the former being higher by 2·1, and the latter by ·03, than the corresponding rates in the previous year. Twenty-one of the cases and 2 of the deaths were returned as tubercle of the lungs. *Venereal diseases* caused 4 admissions, as compared with 6 in 1899; three of the cases were returned as primary and one as secondary syphilis. Seven cases of *parasitic diseases* are recorded, as compared with 4 in the preceding year. *Alcoholism* caused 5 admissions (1 fatal). Two of the admissions and the death were returned as delirium tremens. In 1899 there was 1 admission and no death under this head. *Rheumatism* was the cause of 215 admissions and 2 deaths, being in the ratios of 23·5 and ·22 per 1,000, as compared with 13·9 and ·27 in the previous year. The cases comprised 194 of rheumatism, 16 of rheumatic fever, and 5 of gout. Under the head of *debility*, 635 cases are returned, equal to a ratio of 69·4 per 1,000, which is higher than the corresponding rate in the previous year by 4·9. Two deaths are recorded. Among 129 admissions for *other general diseases*; anæmia is shown as the cause of 106 admissions, and malignant new growth 11. There were 7 deaths, 6 from malignant new growth, and 1 from diabetes.

LOCAL DISEASES.—*Diseases of the Nervous System.*—The number of admissions under this head was 163, with 4 deaths, constituting an admission rate of 17·8, and a death rate of ·44 per 1,000, the former being higher by 2·3, and the latter by ·35, than the corresponding ratios in 1899. The principal causes of sickness were neuralgia 112 cases, hysteria and epilepsy 17 each, and paralysis 5. There was also a single admission for melancholia. The fatal cases are recorded as paralysis 2, meningitis 1, and eclampsia 1.

Diseases of the Eye gave an admission rate of 3·4 per 1,000, exactly the same as in the previous year. Among the 31 admissions giving this ratio 19 were cases of conjunctivitis, 4 staphyloma and 3 perverted visual sensations.

Diseases of other Organs of Special Sense gave 8 admissions, 6 of which were aural affections, and 2 diseases of the nose.

Diseases of the Circulatory System.—Under this head 76 admissions and 6 deaths are recorded, equal to ratios of 8·3 and ·65 per 1,000, respectively.

United Kingdom.

Compared with the returns for the previous year there is an increase of 1·4 in the sick rate, and of ·12 in the death rate. The principal causes of sickness were varicose veins 28 cases, valvular disease of the heart 20, disordered action of the heart 16, and phlebitis 5 cases. The fatal cases are recorded as valvular disease of the heart 2, and pericarditis, thrombosis, phlebitis, and excessive growth of fat on the heart 1 case each.

Diseases of the Respiratory System caused an admission rate of 63·2 and a death rate of 1·42 per 1,000, which shows an increase as compared with the ratios for 1899 of 6·9 and 1·15 respectively. Out of 578 admissions 478 were cases of bronchial affections, and among the remainder were 32 cases of spasmodic asthma, 20 of pleurisy, and 17 each of pneumonia and phthisis. There were 13 deaths, 9 from phthisis, and 2 each from bronchitis and pneumonia.

Diseases of the Digestive System caused 884 admissions, giving a ratio of 96·6 per 1,000, as compared with 75·9 for 1899. The majority of admissions under this heading were due to affections of the mouth and throat, and indigestion; there were also many cases of diarrhœa, inflammation of stomach, and colic. There were no deaths.

Diseases of the Lymphatic System, with 15 admissions, gave an admission rate of 1·6 per 1,000, as compared with 1·0 in the preceding year.

Diseases of the Urinary System caused 16 admissions and 5 deaths, being in the ratios of 1·8 and ·55 per 1,000 respectively. Compared with the figures for 1899 there is a decrease of ·9 in the sick rate, and an increase of ·46 in the death rate. The deaths were 2 from Bright's disease, and 1 each from nephritis, dropsy, and albuminuria.

Diseases of the Generative System caused 281 admissions and 3 deaths, equal to a ratio of 30·7 and ·33 per 1,000 respectively, the former showing a decrease of 6·4 and the latter an increase of ·24 as compared with the corresponding ratios in the previous year. 142 of the cases were dependent on affections connected with pregnancy, 75 were cases of functional disorders, 31 were uterine disorders, 23 affections of the breast, and 9 affections of the ovaries. The fatal cases were due to functional disorders 2, and abortion 1.

Diseases of the Organs of Locomotion gave a ratio of 2·9 per 1,000, *diseases of the connective tissue* one of 9·3 per 1,000 (with 1 death), and *diseases of the skin* one of 13·9 per 1,000; all being higher than the corresponding ratios in the previous year.

Injuries.—82 are recorded, being in the ratio of 8·10 per 1,000, as compared with 6·8 in the previous year; 65 of the injuries were cases of wounds, contusion, sprains or burns and scalds. There were 9 cases of fracture of bones and 5 of dislocation of joints.

Poisons.—Under this head 1 admission is recorded.

Children.

The average strength of children borne on the strength of the army in the United Kingdom was 18,156. The attacks of illness numbered 10,185 and the deaths 378, giving a sick rate of 560·8, and a death rate of 20·82 per 1,000. Compared with the corresponding ratios in the previous year, an increase of 53·5 is shown in the sick rate and of 2·51 in the death rate.

General Diseases.—Under the head of *other eruptive fevers* there were 1,835 admissions and 34 deaths, being in the ratios of 101·1 and 1·87 respectively, as compared with 94·9 and 1·27 in the previous year. Measles accounted for 1,298 of the cases, or 50 less than in 1899. The number of deaths was 27, as compared with 13. The stations at which the greatest number of admissions occurred were Aldershot 230 cases, Curragh 131, Woolwich 67, Lichfield 65, and London 55. Rubella caused 93 admissions, as compared with 119 in 1899. Scarlet fever gave 196 admissions and 7 deaths; 24 of the cases occurred at Aldershot, 22 at Woolwich, and 20, with 3 deaths, at Queenstown. The other cases of eruptive fevers were 246 of chicken-pox, and 2 of cow-pox.

Influenza caused 412 admissions and 5 deaths. 89 admissions and 17

deaths were due to *diphtheria*, equal to ratios of 4·9 and ·93 per 1,000 respectively, as compared with 3·8 and ·94 in the previous year; 19 of the cases, with 1 death, occurred at Colchester, where the disease was prevalent among the civil population, 14 at Woolwich, 6, with 1 death, at Chatham, and 5, with 3 deaths, at Lichfield. *Enteric fever* caused 16 admissions, as compared with 11 in the previous year. 5 cases occurred at Dublin, in two of which suspicion attached to the milk supply; the cause was not traced in the remaining three cases, which all occurred in one family, although enteric is said to have been prevalent in the neighbourhood; 1 at Tralee was probably contracted while residing at Gosport, and in the remainder, which occurred as follows, 3 at Portsmouth, 2 at Gosport, and 1 each at Netley, Southampton, Kingston-on-Thames, Shoeburyness and Canterbury, no cause can be assigned. There were no deaths. *United Kingdom.*

Other continued fevers gave 48 admissions, and 1 death, equal to a ratio of 2·6 and ·06 per 1,000 respectively, as compared with 4·2 and *nil* in the previous year. With two exceptions, all were cases of simple continued fever. The death was due to cerebro-spinal fever. *Dysentery* caused 5 admissions, as compared with 6 in 1899. *Malarial fevers* gave 24 admissions and 1 death, equal to ratios of 1·3 and ·06 respectively, as compared with 1·7 and *nil* in the previous year. All the admissions were for ague, and the death was also due to this cause. *Septic diseases* were the cause of 9 admissions and 1 death. 8 of the cases and the death were due to erysipelas, and 1 to septicæmia. Under the head of *tubercular diseases* 52 admissions and 15 deaths are recorded, being in the ratios of 2·9 and ·82 per 1,000 respectively, as compared with 2·3 and ·98, the corresponding ratios in the previous year. 14 of the cases and 5 of the deaths were due to tubercle of the lungs. Under the head of *venereal diseases* there were 3 admissions for congenital syphilis, 1 of which proved fatal. In the previous year there were 4 admissions and 3 deaths. *Parasitic diseases* gave 144 admissions, equal to a ratio of 7·9 per 1,000, which is exactly similar to the ratio in the previous year. Ringworm was the principal cause of admission. Under the head of *rheumatism* 82 admissions and 1 death are recorded, 4 being cases of rheumatic fever. 599 admissions and 20 deaths are returned under the head of *debility*, being in the ratios of 33·0 and 1·10 per 1,000 respectively, as compared with 18·0 and ·98, the corresponding ratios for the previous year. *Other general diseases* included 385 cases of whooping-cough, 143 of mumps, 39 of anæmia, 14 of rickets, and 10 of immaturity at birth. 35 deaths are shown under this head, viz., 18 from whooping-cough, 11 from immaturity at birth, 3 from congenital malformations, and 1 each from premature birth, anæmia and hæmophilia.

Local Diseases.—*Diseases of the Nervous System.*—The number of admissions was 222, with 63 deaths, the ratios of sickness and mortality being 12·2 and 3·47 per 1,000 respectively, as compared with 9·3 and 2·82, the corresponding ratios in the previous year. The principal cause of sickness was eclampsia, 101 of the admissions and 38 of the deaths being returned under that head. Of the remaining cases the most important admissions were neuralgia 33 cases, inflammation of the brain and its membranes 30 cases with 18 deaths, laryngismus stridulus 19 cases with 4 deaths, epilepsy 9 cases with 1 death, chorea 7 cases, and internal hydrocephalus 6 cases with 1 death. There was also 1 death from nervous weakness.

Diseases of the Eye caused 186 admissions, principally cases of conjunctivitis.

Diseases of other Organs of Special Sense gave an admission ratio of 2·2 per 1,000, as compared with 3·7 in the previous year. Of the 40 admissions, 37 were aural diseases, principally inflammation of the external meatus, and 3 were affections of the nose.

Diseases of the Circulatory System gave 26 admissions, of which 9 cases were due to valvular disease of the heart, 6 to disordered action of the heart, and 4 each to varix and nævus. There were 3 deaths, 1 each from valvular disease of the heart, disordered action of the heart and embolism.

Diseases of the Respiratory System caused 2,584 admissions and 94 deaths, The ratio of admission for these diseases was 142·3, and the death rate 5·18

United Kingdom.

per 1,000, as compared with 134·9 and 4·46 in the previous year; 2,363 of the admissions were for bronchial affections. The deaths were 52 from bronchitis, 20 from pneumonia (out of 113 admissions), 16 from broncho-pneumonia, 3 from laryngitis, 2 from phthisis, and 1 from congestion of lung.

Diseases of the Digestive System caused 2,163 admissions and 69 deaths, being in the ratios of 119·1 and 3·80 per 1,000 respectively, both higher than the corresponding rates in the previous year. The principal causes of sickness were affections of the mouth and throat 836 cases, diarrhœa 642 cases, indigestion 230, enteritis 160, disorders of dentition 99, and inflammation of stomach 86 cases. The causes of death were diarrhœa 37 cases, enteritis 17, disorders of dentition 4, tonsillitis 3, jaundice and stomatitis 2 each, and sore throat, colic, colitis and intussusception 1 case each.

Diseases of the Lymphatic System caused 71 admissions, all but 19 being cases of inflammation of glands. The admission rate, 3·9 per 1,000, is fractionally lower than that for the previous year.

Diseases of the Urinary System caused 7 admissions and 1 death, 3 being cases of acute nephritis. The death was due to Bright's disease. *Diseases of the generative system* show 58 cases and 1 death, and *diseases of the organs of locomotion* account for 12 admissions. *Diseases of the connective tissue* gave an admission rate of 7·5 per 1,000, dependent on 115 cases of abscess, with 1 death, 21 of inflammation with 1 death, and a single case of œdema.

Diseases of the Skin caused 419 admissions, equal to a ratio of 23·1 per 1,000, or 3·0 higher than the corresponding rate for 1899. The most frequent ailments were eczema, impetigo, ulcers, urticaria, herpes, boils, psoriasis, and whitlow. There were no deaths.

INJURIES were 333 in number, equal to a ratio of 18·3 per 1,000, being lower, as compared with the corresponding rate for the previous year, by 5·2. The principal injuries were wounds 107, contusions 72, burns and scalds 62, fracture of bones 37, and sprains 25. The deaths were 8 from burns and scalds, 2 from concussion of brain, and 1 each from multiple injury, suffocation, exhaustion, and fracture of skull.

VACCINATION.

In the accompanying table will be found the conditions as to vaccination of all recruits found on inspection fit for the service during the year, together with the proportion per 1,000 of each condition :—

1900.	Number of Recruits found on Inspection fit for the Service.	Proportion per 1,000.
Had marks of vaccination	58,815	959·5
Had marks of small-pox	239	3·9
Had neither marks of vaccination nor of small-pox	2,243	36·6
Total	61,297	1000·0

As compared with the results in the preceding year, an increase of 3·1 per 1,000 is observed among recruits bearing marks of vaccination, and of ·1 among those bearing marks of small-pox, but a decrease of 3·2 among those bearing neither marks of vaccination nor of small-pox.

The following tables, compiled from the annual returns of principal medical officers, show the number of vaccinations performed during the year, with the proportions per 1,000 of successful or modified results or of failures, amongst individuals vaccinated with lymph from the Army Vaccine Institute, Aldershot, or with lymph from other sources :—

United Kingdom.

Results.	Vaccinated during the Year.						Proportion per 1,000.					
	With Lymph from Army Vaccine Institute, Aldershot.		With Lymph from Other Sources.		Total.		With Lymph from Army Vaccine Institute, Aldershot.		With Lymph from Other Sources.		Total.	
	Primary Vaccination.	Re-Vaccination.	Primary Vaccination.	Re-Vaccination.	Primary Vaccination.	Re-Vaccination.	Primary Vaccination.	Re-Vaccination.	Primary Vaccination.	Re-Vaccination.	Primary Vaccination.	Re-Vaccination.
TABLE I.—*Recruits.*												
Perfect vaccine pustules	742	19,295	381	3,476	1,123	22,771	766·5	510·0	1,000·0	773·8	832·5	538·0
Modified vaccine pustules	161	13,935	—	690	161	14,625	166·3	368·4	—	153·6	119·3	345·6
Failures	65	4,599	—	326	65	4,925	67·2	121·6	—	72·6	48·2	116·4
Total	968	37,829	381	4,492	1,349	42,321	1,000·0	1,000·0	1,000·0	1,000·0	1,000·0	1,000·0
TABLE II.—*Soldiers other than Recruits.*												
Perfect vaccine pustules	58	456	11	11	69	467	644·4	456·0	1,000·0	1,000·0	683·2	461·9
Modified vaccine pustules	22	404	—	—	22	404	244·5	404·0	—	—	217·8	399·6
Failures	10	140	—	—	10	140	111·1	140·0	—	—	99·0	138·5
Total	90	1,000	11	11	101	1,011	1,000·0	1,000·0	1,000·0	1,000·0	1,000·0	1,000·0
TABLE III.—*Soldiers and Recruits.*												
Perfect vaccine pustules	800	19,751	392	3,487	1,192	23,238	756·1	508·7	1,000·0	774·4	822·1	536·3
Modified vaccine pustules	183	14,339	—	690	183	15,029	173·0	369·3	—	153·2	126·2	346·8
Failures	75	4,739	—	326	75	5,065	70·9	122·0	—	72·4	51·7	116·9
Total	1,058	38,829	392	4,503	1,450	43,332	1,000·0	1,000·0	1,000·0	1,000·0	1,000·0	1,000·0

nited Kingdom.

The primary vaccinations and re-vaccinations during the year, as shown above, give a total of 44,782 operations among all classes of soldiers. This number is greater than the number of vaccinations in the preceding year by 7,348. The number of vaccinations among recruits was 43,670, an increase of 7,425, and the number among soldiers 1,112, being a decrease of 77. The number of recruits found on inspection fit for service during the year was 61,297, and as the number vaccinated was 43,670, as recorded by the returns furnished to the War Office, there are 17,627 not accounted for in the vaccination tables. This is explained by the fact that recruits who joined from the militia had been satisfactorily vaccinated while in that force, while others enlisted so late in the year that the results of their vaccination do not appear in the returns. Moreover in some instances recruits have deserted before vaccination was carried out.

Amongst all classes of soldiers, as shown in Table III, primary vaccinations, compared with the corresponding results in 1899, show an increase of 385·4 per 1,000 in the proportion of perfect results, a decrease of 182·5 in the proportion of modified results, and one of 202·9 in the proportion of failures. As regards re-vaccinations, there was a decrease of 17·2 per 1,000 in the proportion of perfect results, an increase of 27·4 in the proportion of modified results, but a decrease of 10·2 in the proportions of failures.

Women.—There were 4 primary vaccinations among the women, which were all perfect. 125 cases of re-vaccination gave 34, or 272·0 per 1,000, perfect results, 85, or 680·0 per 1,000, modified results, and 6, or 48·0 per 1,000, of failures. Compared with the previous year there is a decrease of 369·0 per 1,000 in the proportion of perfect results, an increase of 346·7 in the proportion of modified results, and of 22·3 in the proportion of failures.

Children.—The number of primary vaccinations among the children was 1,901, of which 1,458 were perfect, the remainder being failures, equal to ratios of 767·0 and 233·0 per 1,000 respectively. As compared with the previous year there is a decrease of 74·5 per 1,000 in the proportion of perfect results, and a corresponding increase in the proportion of failures. 489 cases of re-vaccination gave 423 or 865·0 per 1,000 perfect results, and 66 or 135·0 per 1,000 failures. Compared with the previous year there is an increase of 405·9 per 1,000 in the proportion of perfect results, and a corresponding decrease in the proportion of failures.

On the Recruiting of the Army.

United Kingdom.

According to the Annual Returns of Principal Medical Officers the number of recruits inspected during the year was 84,402. Of these 23,105, or 273·75 per 1,000, were rejected as unfit, and 61,297, or 726·25 per 1,000, passed fit for the service. 640 of the latter were, however, subsequently discharged as unfit for service within three months of enlistment, thus making the total number of rejections equal to 23,745, or a ratio of 281·33 per 1,000.

These facts are shown in the subjoined table :—

Table I.

Number of Recruits Inspected.	Number Rejected.			Ratio of Rejections per 1,000 inspected.		
	On Inspection.	Unfit within Three Months of Enlistment.	Total.	On Inspection.	Unfit within Three Months of Enlistment.	Total.
84,402	23,105	640	23,745	273·75	7·58	281·33

Compared with the corresponding ratios of the previous year a decrease of 50·41 per 1,000 has occurred in the ratio of rejection on inspection, but an increase of 1·22 in that of those rejected within three months of enlistment. The total ratio of rejection has, therefore, decreased by 49·19, the ratio of men found fit having increased by the same amount.

The native countries of recruits, the ratios of rejection, and the proportion per 1,000 furnished by each country are given in the following table :—

Table II.

Native Countries of Recruits.	Number Inspected.	Number Rejected.	Ratio Rejected per 1,000 Inspected.	Proportion per 1,000 Recruits furnished by each Country.
England and Wales ..	66,590	18,752	281·60	789
Scotland	8,188	2 330	284·56	97
Ireland	8,749	2,450	280·03	104
British Colonies and Foreign Countries ..	875	213	243·43	10
Total	84,402	23,745	281·33	1,000

Compared with similar statistics published in the report for the previous year, the ratio of rejection of recruits born in England and Wales has decreased by 42·40, that of recruits born in Scotland by 31·15, that of recruits born in Ireland by 46·11, and that of those born in the Colonies or Foreign Countries by 27·12 per 1,000.

United Kingdom.

The proportion per 1,000 recruits furnished by England and Wales has increased by 23, that for Scotland and Ireland has decreased by 8 and 15 respectively, while that for the Colonies remains the same as last year.

In Table III are shown the occupations of recruits previous to enlistment, the ratio rejected per 1,000 of each group of occupations, and the proportion of each group in every 1,000 men inspected :—

TABLE III.

Occupations of Recruits.	Number Inspected.	Number Rejected.	Ratio Rejected per 1,000 Inspected.	Proportion of each Group in 1,000 Recruits Inspected.
1. Labourers, Servants, Husbandmen, &c.	52,022	15,025	288·82	616
2. Manufacturing Artisans (Clothworkers, Weavers, Lace Makers, &c.)	11,971	3,478	290·54	142
3. Mechanics employed in Occupations favourable to physical development (Smiths, Carpenters, Masons, &c.) ..	11,201	2,923	260·96	133
4. Shopmen and clerks	5,950	1,826	306·89	70
5. Professional Occupations, Students, &c.	827	220	266·02	10
6. Boys under 17 years of age	2,431	273	112·30	29
Total	84,402	23,745	281·33	1,000

Compared with the previous year there is a decrease of 48·59 per 1,000 in the ratio of rejections of Class I (labourers, &c.), of 66·33 in Class II (manufacturing artisans), of 42·29 in Class III (mechanics, &c.), of 33·67 in Class IV (shopmen and clerks), of 13·72 in Class V (professional occupations), and of 29·57 in Class VI (boys under seventeen years of age).

The proportions of the different classes of occupations, as compared with the preceding year, show a decrease of 33 per 1,000 recruits inspected in Class I (labourers, &c.), and of 1 in Class VI (boys under seventeen years of age); but an increase of 1 in Class II (manufacturing artisans), of 30 in Class III (mechanics, &c.), of 2 in Class IV (shopmen and clerks), and of 1 in Class V (professional occupations).

The following table gives the number of recruits rejected on inspection during the year according to the different causes of rejection arranged in classes, and the ratio per 1,000 of rejection in each class, the same information being also given regarding recruits unfit within three months of enlistment :—

TABLE IV.

United Kingdom.

Causes of Rejections in Classes.	Total Inspected, 84,402.			
	Number Rejected on Inspection.	Ratio per 1,000 Rejected on Inspection.	Unfit within Three Months of Enlistment.	Ratio per 1,000 Rejected as Unfit within Three Months of Enlistment.
1. Syphilis	187	2·21	1	·01
2. Tubercle	83	·98	11	·13
3. Impaired Constitution and Debility	417	4·94	32	·38
4. Other General Diseases	340	4·03	18	·21
5. Diseases of Nervous System	48	·57	58	·69
6. Weakness of Intellect	67	·79	62	·73
7. Defective Vision	3,074	36·42	11	·13
8. Diseases of Eyes and Eyelids	351	4·16	17	·20
9. Diseases of Nose and Mouth	52	·62	6	·07
10. Disease of Ears	102	1·21	18	·21
11. Deafness	106	1·26	23	·27
12. Impediment of Speech	107	1·27	3	·04
13. Disease of Heart	1,110	13·15	71	·84
14. Disease of Arteries (Aneurysm)	8	·10	—	—
15. Disease of Veins (Varix)	987	11·69	31	·37
16. Disease of Lungs (except Tubercle)	111	1·32	13	·15
17. Loss or Decay of many Teeth	1,690	20·02	11	·13
18. Hernia	588	6·97	29	·34
19. Laxity of Abdominal Rings	99	1·17	—	—
20. Hæmorrhoids	49	·58	1	·01
21. Diseases of the Urinary Organs	57	·68	24	·29
22. Varicocele	946	11·21	20	·24
23. Other Diseases of the Genital Organs (not Syphilitic).	106	1·26	4	·05
24. Defects of Upper Extremities, from Fracture, Contraction, Luxation, &c.	318	3·77	17	·21
25. Defects of Lower Extremities, from Fracture, Contraction, Luxation, &c.	889	10·53	78	·92
26. Flat Feet	761	9·02	25	·30
27. Diseases of Joints	220	2·61	1	·01
28. Other Affections of Bones and Muscles.	154	1·82	3	·04
29. Ulcers, Wounds, and Cicatrices	131	1·55	10	·12
30. Other Affections of the Cutaneous System.	207	2·45	5	·06
31. Malformation of Ears	3	·04	—	—
32. Malformation of Nose and Mouth	12	·14	1	·01
33. Malformation of Chest and Spine	332	3·93	20	·24
34. Malformation of Urinary or Genital Organs.	25	·30	1	·01
35. Under Height	1,281	15·18	—	—
36. Under Chest Measurement	5,051	59·84	8	·09
37. Under Weight	2,407	28·52	—	—
38. Apparent Age not in accordance with Regulations.	321	3·80	—	—
39. Not likely to become efficient	257	3·04	7	·08
40. Over Height	51	·60	—	—
Total rejected	23,105	273·75	640	7·58

United Kingdom.

The largest number of rejections on inspection was caused by defective development (under height, weight, and chest measurement), the ratio of rejections under the headings 35, 36, and 37 being 103·54. This is a decrease of 16·35 as compared with the corresponding ratio for the previous year.

Deficient chest measurement gives the highest ratio amongst these developmental causes of rejection, namely, 59·84 per 1,000, but this is lower than the corresponding ratio in 1899 by 6·00. The ratios of rejection for deficient weight and for being under height have also decreased by 5·32 and 5·03 per 1,000 respectively.

Among other causes of rejection, defective vision was the most frequent, the ratio being 36·42 per 1,000, which is lower by 5·57 than in 1899. The next most frequent causes of rejection were loss or decay of many teeth, 20·02 per 1,000; disease of heart, 13·15 per 1,000; disease of veins, 11·69 per 1,000; varicocele, 11·21 per 1,000; defects of lower extremities, 10·53 per 1,000; and flat feet, 9·02 per 1,000. In the previous year these conditions were also the more frequent causes of rejection, but the order of their frequency and the ratios themselves vary.

Among the recruits found unfit within three months after enlistment, the most frequent causes of rejection were defects of lower extremities (78), disease of heart (71 cases), weakness of intellect (62), diseases of nervous system (58), impaired constitution (32), disease of veins (31), and hernia (29).

Ages, Heights, Weights, and Chest Measurements of all Recruits finally approved for Service during the Year.

In the following table are shown the ages of all recruits finally approved for service, and the proportion of each age per 10,000 :—

TABLE V.

Ages.	Numbers finally approved for Service.	Proportion per 10,000.
Boys under 17 years	2,158	356
From 17 to 18 „	1,141	188
„ 18 to 19 „	22,142	3,650
„ 19 to 20 „	11,244	1,854
„ 20 to 21 „	6,617	1,091
„ 21 to 22 „	4,453	734
„ 22 to 23 „	3,384	558
„ 23 to 24 „	2,258	372
„ 24 to 25 „	1,898	313
25 years and upwards	5,362	884
Total	60,657	10,000

It will be seen from the above table that recruits between 18 and 19 years of age give the greatest number of those passed fit for the service, the proportion per 10,000 at that age being 3,650. In the preceding year the proportion was 4,186 for this age. Of the ages between 19 and 20 years, and

20 to 21 years, the proportions, 1,854 and 1,091 in every 10,000 approved, resemble the corresponding proportions in 1899, namely, 2,088 and 1,079 respectively, and the remaining ages show a similar sequence in the proportion of recruits finally approved, with the exception of 25 years and upwards, which gives a proportion per 10,000 of 884, being an increase of 764 on that for 1899. *United Kingdom.*

The next table gives the heights of recruits finally approved, and the proportion of each height per 10,000. It also gives the heights of recruits finally approved, arranged in series according to age, together with the proportion per 10,000 of each height at each age.

TABLE VI.

Heights of Recruits finally approved for Service.	Boys under 17 years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 years and upwards.	Total at each Height.
ft. in. ft. in.											
Under 5 3 ...	1,749	142	1,533	555	347	169	120	110	51	51	4,826
5 3 to 5 4 ...	196	301	3,964	1,496	931	546	475	224	161	221	8,518
5 4 to 5 5 ...	103	229	4,528	1,943	1,038	666	468	376	260	707	10,318
5 5 to 5 6 ...	61	159	4,255	2,127	1,097	773	583	361	281	935	10,632
5 6 to 5 7 ...	17	143	3,162	1,879	977	697	546	346	336	1,030	9,073
5 7 to 5 8 ...	24	82	2,151	1,425	854	576	397	284	278	937	7,048
5 8 to 5 9 ...	5	50	1,397	839	655	446	331	225	221	657	4,826
5 9 to 5 10 ...	3	18	703	521	379	304	246	168	152	419	2,913
5 10 to 5 11 ...	1	12	267	303	181	161	119	94	83	232	1,453
5 11 to 6 0 ...	—	3	136	98	98	72	64	40	47	103	661
6 0 and upwards	—	2	66	58	60	43	35	20	25	70	389
Total at each age	2,158	1,141	22,142	11,244	6,617	4,453	3,384	2,258	1,898	5,362	60,657

Heights of Recruits finally approved for Service.	Proportions per 10,000 at each Age.										Total Proportion of each Height per 10,000.
	Boys under 17 years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	
ft. in. ft. in.											
Under 5 3 ...	8,100	1,245	692	494	524	379	355	487	269	95	796
5 3 to 5 4 ...	908	2,638	1,790	1,331	1,407	1,226	1,404	992	864	412	1,404
5 4 to 5 5 ...	477	2,007	2,045	1,728	1,569	1,496	1,383	1,665	1,370	1,319	1,701
5 5 to 5 6 ...	283	1,394	1,922	1,892	1,658	1,736	1,723	1,599	1,480	1,744	1,753
5 6 to 5 7 ...	79	1,253	1,401	1,671	1,476	1,565	1,613	1,532	1,770	1,921	1,495
5 7 to 5 8 ...	111	719	990	1,267	1,291	1,293	1,173	1,258	1,465	1,747	1,162
5 8 to 5 9 ...	23	438	631	746	990	1,002	978	997	1,164	1,225	796
5 9 to 5 10 ...	14	158	317	463	573	683	727	744	801	781	480
5 10 to 5 11 ...	5	105	121	269	273	361	352	416	437	433	239
5 11 to 6 0 ...	—	26	61	87	148	162	189	177	248	192	109
6 0 and upwards ...	—	17	30	52	91	97	103	133	132	131	64
Total ...	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000

United Kingdom.

Compared with a similar return for the previous year the proportion of recruits under 5 feet 3 inches in height per 10,000 approved has increased by 401, between 5 feet 3 inches and 5 feet 4 inches by 111, and over 6 feet by 1; while the proportion of recruits between 5 feet 4 inches and 5 feet 5 inches in height has decreased by 138, between 5 feet 5 inches and 5 feet 6 inches by 164, between 5 feet 6 inches and 5 feet 7 inches by 50, between 5 feet 7 inches and 5 feet 8 inches by 82, between 5 feet 8 inches and 5 feet 9 inches by 18, between 5 feet 9 inches and 5 feet 10 inches by 33, between 5 feet 10 inches and 5 feet 11 inches by 15, and between 5 feet 11 inches and 6 feet by 13.

Omitting boys under 17 years of age, the highest proportion of recruits approved was between 17 and 18 years of age and between 5 feet 3 inches and 5 feet 4 inches in height, namely, 2,638 per 10,000. The next highest proportion was 2,045 per 10,000 among recruits between 18 and 19 years of age and between 5 feet 4 inches and 5 feet 5 inches in height. In the preceding year the results were similar as regards ages and heights. With regard to the recruits between 18 and 19 years of age, at which age the great majority of recruits is obtained, 2,045 per 10,000 were between 5 feet 4 inches and 5 feet 5 inches in height, and 1,922 per 10,000 between 5 feet 5 inches and 5 feet 6 inches. This shows a decrease as compared with the previous year, when the proportion was 2,180 per 10,000 between 5 feet 4 inches and 5 feet 5 inches in height, and 2,101 per 10,000 between 5 feet 5 inches and 5 feet 6 inches in height.

The next table shows the weights of the recruits who were finally approved, and the proportion of each weight per 10,000. It also shows the weights of these recruits arranged in series according to age, together with the proportion per 10,000 of each weight at each age :—

TABLE VII.

Weights of Recruits finally approved for Service.	Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	Total at each Weight.
Under 100 lbs. ...	1,628	33	4	—	—	—	—	—	—	2	1,667
100—110 lbs. ..	341	186	320	67	31	13	12	6	2	32	1,010
110—120 ,, ...	147	543	8,730	2,763	1,332	759	528	291	144	356	15,593
120—130 ,, ..	36	237	7,966	4,138	2,170	1,237	965	584	440	1,037	18,810
130—140 ,, ..	5	100	3,587	2,695	1,688	1,250	893	611	567	1,400	12,796
140—150 ,, ...	1	82	1,132	1,097	913	752	594	412	421	1,194	6,548
150—160 ,, ...	—	4	291	360	352	303	255	220	203	714	2,702
160—170 ,, ...	—	5	96	92	106	111	106	91	87	355	1,049
Upwards of 170 lbs.	—	1	16	32	25	28	31	43	54	272	482
Total at each age	2,158	1,141	22,142	11,244	6,617	4,453	3,384	2,258	1,898	5,362	60,657

Weights of Recruits finally approved for Service.	Proportions per 10,000 at each Age.										Total Proportion of each Weight per 10,000.
	Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	
Under 100 lbs. ...	7,544	289	2	—	—	—	—	—	—	4	275
100—110 lbs. ...	1,580	1,630	145	60	47	29	35	27	11	60	167
110—120 ,, ...	681	4,759	3,943	2,457	2,013	1,705	1,560	1,289	759	664	2,571
120—130 ,, ...	167	2,077	3,598	3,680	3,279	2,778	2,852	2,586	2,318	1,934	3,101
130—140 ,, ...	23	876	1,620	2,397	2,551	2,807	2,639	2,706	2,987	2,611	2,109
140—150 ,, ...	5	281	511	976	1,380	1,689	1,755	1,825	2,218	2,227	1,080
150—160 ,, ..	—	35	131	320	532	680	754	974	1,070	1,331	445
160—170 ,, ...	—	44	43	82	169	249	313	403	458	662	173
Upwards of 170 lbs.	—	9	7	28	38	63	92	190	179	507	79
Total	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000

Compared with the corresponding return for the previous year an increase of 29 per 10,000 has occurred in the proportion of recruits between 100 and 110 lbs. in weight, of 54 between 110 and 120 lbs., of 58 between 140 and 150 lbs., of 55 between 150 and 160 lbs., of 21 between 160 and 170 lbs., and of 43 in the proportion of recruits over 170 lbs. in weight. The proportion of recruits per 10,000 under 100 lbs. in weight has decreased by 32, by 167 between 120 and 130 lbs., and by 61 in the proportion of recruits between 130 and 140 lbs. in weight. *United Kingdom.*

Omitting boys, the highest proportion of recruits approved was between 17 and 18 years of age and between 110 and 120 lbs. in weight, namely, 4,759 per 10,000. The next highest number was 3,943 per 10,000 among recruits between 18 and 19 years of age and between 110 and 120 lbs. In the preceding year the highest proportion was at the same age and weight as in the year under report, and the next highest was among recruits between 18 and 19, but between 120 and 130 lbs. in weight

In the next table are shown the chest measurements of recruits finally approved and the proportion of each measurement per 10,000. The table also shows the chest measurements arranged in series according to age, together with the proportion per 10,000 of each chest measurement at each age.

TABLE VIII.

Chest measurement of Recruits finally approved for Service.	Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	Total at each Chest Measurement.
Under 31 inches ...	1,761	69	46	10	—	1	—	—	1	1	1,889
31—32 inches ...	241	145	459	142	24	15	8	8	2	15	1,059
32—33 ,, ...	113	334	5,148	1,383	704	410	203	166	58	159	8,778
33—34 ,, ...	36	296	7,703	3,536	1,674	952	643	427	294	561	16,122
34—35 ,, ...	7	187	5,665	3,490	1,996	1,395	968	627	546	1,227	16,108
35—36 ,, ...	—	83	2,129	1,792	1,268	889	744	487	456	1,202	9,049
36—37 ,, ...	—	22	668	617	636	521	432	299	290	974	4,459
37—38 ,, ...	—	5	269	225	241	206	177	167	162	657	2,110
Above 38 inches ...	—	—	55	49	74	65	109	77	88	566	1,083
Total at each age	2,158	1,141	22,142	11,244	6,617	4,453	3,384	2,258	1,898	5,362	60,657

Chest measurement of Recruits finally approved for Service.	Proportions per 10,000 at each Age.										Total proportion of each Chest Measurement per 10,000.
	Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	
Under 31 inches ...	8,160	605	21	9	—	2	—	—	5	2	311
31—32 inches ...	1,117	1,271	207	126	36	34	24	35	10	28	174
32—33 ,, ...	524	2,927	2,325	1,229	1,064	921	895	735	306	297	1,447
33—34 ,, ...	167	2,594	3,479	3,145	2,530	2,138	1,900	1,891	1,549	1,046	2,658
34—35 ,, ...	32	1,639	2,558	3,104	3,017	3,133	2,860	2,777	2,877	2,288	2,656
35—36 ,, ...	—	727	962	1,594	1,916	1,994	2,199	2,157	2,402	2,242	1,492
36—37 ,, ...	—	193	302	549	961	1,170	1,277	1,324	1,528	1,816	735
37—38 ,, ...	—	44	121	200	364	462	523	740	859	1,225	348
Above 38 inches ...	—	—	25	44	112	146	322	341	464	1 056	179
Total	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000

Compared with the return for the preceding year an increase of 22 per 10,000 has occurred in the proportion of recruits between 31 and 32 inches chest measurement, of 107 between 34 and 35 inches chest measurement, and of 412 in that of recruits over 35 inches chest measurement. The proportion of recruits under 31 inches chest measurement has decreased by 12, of those between 32 and 33 inches by 212, and of those between 33 and 34 inches chest measurement by 317.

Omitting boys, the highest proportion of recruits at any age and of any chest measurement was 3,479 among recruits between 18 and 19 years of age and between 33 and 34 inches chest measurement, as compared with 3,730 among recruits between 18 and 19 years of age and between 33 and 34 inches chest measurement in the previous year.

Excluding boys under 17 years of age the following general results are obtained :—The average age of recruits finally approved during the year was 19·9 years, as compared with 19·4 in 1899; the average height was 65·4 inches, as compared with 65·6 of the previous year; the average weight 124·1 lbs., as compared with 123·6 in the preceding year, and the average chest measurement 33·9 inches, as compared with 33·7 inches in 1899.

The next table shows the state of education of recruits finally approved, together with the proportion per 1,000 of those well educated, able to read and write, able to read only, or unable to read.

TABLE IX.

—	Numbers finally approved.	Proportion per 1,000.
Well educated	5,091	84
Able to read and write..	53,904	889
Able to read only	908	15
Unable to read	754	12
Total	60,657	1,000

Compared with the corresponding table for the preceding year an increase of 13 per 1,000 has taken place in the proportion of recruits returned as well educated, and of 2 in that of recruits able to read only, while there is a decrease of 10 in the proportion of recruits able to read and write, and of 5 in that of recruits unable to read.

SANITARY CONDITIONS, UNITED KINGDOM, 1900.

North-Eastern District.

United Kingdom.

The Principal Medical Officer (Colonel W. E. Saunders, C.B., R.A.M.C.) reports that the general health of the troops, during the year, has been good on the whole, and the sanitary condition of barracks generally satisfactory. There was one mild case of small-pox at Scarborough (contracted at Hull) during the year. Five cases of enteric fever occurred, four at Pontefract amongst the men, and one at Derby amongst the women. In no case could any definite cause be assigned, but it is known that the disease is prevalent in the surrounding district of Pontefract. Scarlet fever, which is always more or less present in the large towns of the district, accounted for 38 cases amongst the men, and 19 cases amongst the women and children. Of 94 cases of measles all but 10 were amongst the children. In consequence of the abolition of the Station Hospital, Tynemouth, the sick of the latter garrison are transferred for treatment to the Station Hospital, Newcastle-on-Tyne. As in the previous year convalescents were transferred from other hospitals in the district to Tynemouth and Scarborough for sea air, and were accommodated in barracks. The following is a summary of the reports regarding the sanitary conditions of the several stations in the district:—

Beverley.—New baths have been fixed, and a new wooden floor has been placed in the gymnasium.

Bradford.—Owing to the assembly of drafts for South Africa some overcrowding occurred. The barracks were empty during part of the year; they are well situated but antiquated, and the hospital is not considered suitable for its purpose. The whole of the buildings require reconstruction.

Derby.—The stoves are too large for the amount of fuel allowed, so that the rooms are never properly warmed.

Leeds.—The barracks are old, with rooms over the stables. The situation is high, but it is difficult to keep the rooms clean. Some cases of scarlet fever and measles occurred, and were treated in the civil hospital.

Pontefract.—The drainage is not yet satisfactory, and the question of relaying the main drains is still under consideration; some improvement, however, has taken place as regards their ventilation, though the flushing is not yet satisfactory. Thus, it is stated that a flush-tank is required at the head of the drain between the married blocks and barracks. Some dry earth closets exist, and it is recommended that they should be replaced by water closets. A fatal case of diphtheria occurred at this station, also four cases of enteric fever, one terminating fatally, and a few cases of scarlet fever. Enteric fever is recurring yearly in this garrison, but the water supply which was analyzed at Netley, was found free from contamination.

Richmond.—The drainage from the officers' mess gave some trouble, but the defects were only temporarily remedied pending a relaying of the whole drainage system.

Scarborough.—The surface drainage has been improved. The need of a hospital compound for exercise of convalescent patients is again referred to.

Sheffield.—There was temporary overcrowding in the early part of the year owing to the drafts for South Africa. The heating of the cells was improved. To overcome a nuisance in the prisoners' room, a sawdust urinal was tried, but the result was not satisfactory.

Strensall Camp.—New huts have been erected for the winter accommodation of the troops; but bath and ablution accommodation is stated to be urgently needed. The York Corporation water supply is now laid on to the camp; and no cases of enteric fever have occurred in it this year.

York.—The drainage is again stated to be difficult to keep in order. A new ward is under consideration at the station hospital; and a disinfecting apparatus has been sanctioned. The barrack hut occupied by the detachment Royal Army Medical Corps is comfortless and old, and the urinals and ablution-rooms in the hospital are also said to be unsatisfactory. A new ward and dining-room for convalescents are put forward as being much needed.

North-Western District.

The Principal Medical Officer (Colonel A. W. Duke, R.A.M.C.) reports that the health of the troops was good, and the sanitary conditions of barracks on the whole satisfactory. There were 11 cases of enteric fever in the district during the year, compared with 4 in the preceding year, but it is noted that none of them were due to sanitary defects in the barracks. Five of the cases occurred at Birmingham, all of which were traced to the eating of shell-fish. Of the remaining cases, two occurred at Preston, and one each at Hulme, Seaforth, Warrington and Wrexham, but in four of these cases the men had only recently returned off furlough. There were also 24 admissions for scarlet fever amongst the men, and 10 amongst the children. In connection with 10 of the cases which occurred amongst the men at Liverpool, it is stated that the disease was introduced by a recruit from London. Five severe cases of diphtheria occurred amongst the children at Lichfield, where the disease was prevalent amongst the civil population. At several of the barracks in the district some slight, but unavoidable, overcrowding took place, chiefly owing to the Volunteer Service Companies undergoing training for service in South Africa. The excess numbers were accommodated in the various gymnasia and in billets. No ill effects followed. The following notes are compiled from the sanitary reports of the several stations:—

Ashton-under-Lyne.—Wood block floor is recommended for the gymnasium.

Birmingham.—These barracks were re-opened in March and closed again in December, in order that some improvements should be made in the drainage. Water supply good.

Carlisle.—A new water supply is being laid on. The present supply is, however, reported to be very good.

Chester.—Wood floors were substituted for tiled floors in six of the married quarters. The reconstruction of the hospital, previously recommended, is again brought to notice.

Coventry.—A new oven was erected in the cookhouse; the women's latrine was altered and covered in, and water was laid on to the bath house.

Fleetwood.—The health of the troops was remarkably good, and the medical officer in charge observed that Fleetwood may be regarded as one of the healthiest stations in England.

Lichfield. The ventilation of the guard-room was improved; hot water was laid on to the baths, and new baths have been substituted for the old slate baths. A disinfecting apparatus is required at this station, and steps are being taken to provide one.

Preston. The latrine and ablution accommodation is now completed, and old masonry rubbish-pits were replaced by iron receptacles. A Thresh's disinfector has been provided.

Hulme (Manchester). The drainage of these barracks has been thoroughly overhauled and is now reported to be in a satisfactory condition.

Berwick. A hot water supply has been provided to baths, and new baths have been substituted for the old slate baths. The drain between the women's latrine and the main sewer has been altered.

Worcester. Hot water has been laid on to the baths, and new baths substituted for the old slate baths. The ventilation of the prisoners' room has been improved. The water supply of this station is reported to be liable to pollution from the town and villages.

Hereford.—Jennings's latrines have been provided in place of old pit latrines. Camps were opened during the year at Altcar, Beaumaris and Chipping, and their sanitary condition is stated to have been satisfactory. At other stations in the district nothing of sanitary importance has been noted. *United Kingdom.*

Eastern District.

The Principal Medical Officer (Colonel J. Maturin, R.A.M.C.) reports that the general health of the troops, during the year, was satisfactory, and no case of sickness was attributed to any sanitary defects in barracks. There were 28 cases of scarlet fever which occurred in three stations in the district at different periods of the year, the largest number (16) being at Norwich. Only one case of enteric fever was recorded; this occurred at Colchester, and is stated to have been probably caused by eating shell-fish from a doubtful source. There were also at the same station, 19 admissions and 1 death from diphtheria amongst the children, 1 admission amongst the women, and 2 admissions amongst the troops. The disease was prevalent in the neighbourhood during the summer and autumn months.

In addition to the ordinary sick of the troops stationed in this district, 669 invalids from South Africa were transferred direct from ports of disembarkation to the Station Hospital, Colchester, during the year, the accommodation having been increased during the summer months by 100 beds in marquees pitched in the hospital grounds. Accommodation was also provided, as required, by transferring ordinary sick to outlying hospitals in the district.

The following is a summary of the sanitary conditions in the several stations in the district:—

At *Bedford* the health of the troops was good and the sanitary conditions satisfactory; the drainage, however, was being overhauled with a view to manholes being provided, but the work was not completed during the year. To prevent overcrowding in the spring, it was found necessary to fit up the gymnasium to accommodate about 96 men, and it answered the purpose for the short time it was required.

At *Bury St. Edmunds* the health of the troops and sanitary conditions were satisfactory, and no improvements were carried out during the year.

At *Colchester* the sanitary condition of the permanent barracks was satisfactory, but the old wooden huts, still occupied, required constant repairs and attention. The new barracks, "Sobraon Barracks," situated to the west of the station hospital, were occupied by the non-commissioned officers and men of the 4th Battalion Norfolk Regiment at the close of the year. The officers' mess, quarters, &c., not being completed, and the roads, surface drains, &c., being unfinished, the officers were provided with quarters in the adjacent cavalry barracks.

At *Harwich* everything was in a satisfactory sanitary condition, and no defects were noted.

At *Ipswich* the general sanitary conditions were satisfactory. The backyard of the station hospital was much improved by concrete being laid down. No quarters have yet been provided for the wardmaster.

At *Landguard Fort* the drainage has, since remodelling, worked satisfactorily. The ablution-room inside the fort is reported to be dark and insufficiently provided with bath accommodation, cold water only being laid on, and neglect of cleanliness is the result. The hospital is again referred to as being unsatisfactory in every way; and the married quarters are described as antiquated in their structure, lacking in convenience, cold, damp, and generally uncomfortable. The great requirements of the station are a proper dieted hospital, better bath and ablution accommodation, and more suitable married quarters.

At *Northampton* the sanitary conditions were reported to be satisfactory, and the only improvement carried out was the replacing of old pattern

ated egdon.

Jennings's apparatus in the ablution-rooms of the barracks by plain slate slabs.

At *Norwich* the sanitary condition of the barracks generally was good, and there was an entire absence of enteric fever during the year. The medical officer in charge refers to the situation of the cavalry barracks "near a slum" as being a probable cause of the 16 cases of scarlet fever which appeared amongst the troops occupying them. The want of a hot water supply to the baths in these barracks is again referred to, and skin disease amongst young soldiers is attributed to want of cleanliness.

At *Warley* the general health of the troops was good and the sanitary conditions satisfactory.

At *Weedon* the health of the troops was good, and the general sanitary conditions were satisfactory. The old pattern Jennings's lavatory fittings have been replaced by plain slate slabs. Hot water has also been laid on to two baths, and cast iron baths supplied.

At *Great Yarmouth* the health of the troops was good, and the sanitary conditions of the barracks generally were satisfactory. Convalescents who were sent from inland stations are reported to have derived much benefit from the change.

Western District.

The Principal Medical Officer (Surgeon-General G. J. H. Evatt, M.D., A.M.S.) reports that the general health of the troops has been good. The general sanitary condition of the barracks and hospitals in the district is described as satisfactory, but the unsuitability for occupation of the barracks at Millbay, Plymouth, which from the construction of the buildings are very defective as regards light and ventilation, is again brought to notice.

In addition to the ordinary sick of the troops stationed in this district, 1,452 invalids from South Africa and 40 from other stations abroad were transferred direct from ports of disembarkation to the Station Hospital, Devonport, during the year, the accommodation having been increased by 170 beds in corrugated iron huts. Evacuation of the ordinary sick to outlying stations in the district was also resorted to.

At *Bodmin* a new system of drainage for the barracks has been completed during the year and is working satisfactorily. The want of a drying-room is again noted.

At *Brecon* representations had to be made concerning the unsatisfactory condition of the drainage behind the officers' quarters, and it is stated that a scheme for the entire reconstruction of the barrack drainage is under consideration. The accommodation for married soldiers is said to be insufficient, in some cases too close together, and in others insufficiently warmed.

At *Horfield* (Bristol) bath-rooms have been provided for the use of the troops; and in the garrison cells a hot water apparatus has been fixed to the stove and a new bath provided, with hot and cold water laid on; the old w.c. has also been replaced by a modern wash-out apparatus. The married quarters for the Royal Artillery are said to be old and faulty in construction, but the rooms are large.

At *Cardiff* the fixed basins in the ablution-rooms, which are emptied by foot levers, are noted as constantly becoming inefficient, the water flooding the rooms. Steps are being taken to replace these by movable metal basins and to provide slabs with gratings for the escape of water. The guard-room cell is stated to be unsatisfactory, being dark, badly ventilated and lighted; and inadequate heating of the two large wards in the hospital is also alluded to.

At *Devonport* the sanitary conditions were improved during the year, the men's latrines at Mount Wise Barracks being brought up to a more modern standard, and the drainage of the officers' quarters was remodelled: new ablution and bath rooms were provided and sanitary annexes were erected at New Raglan Barracks. In Maker Barracks a portion of the drainage system was [illegible]: and in Millbay Barracks and at Fort Bovisand the latrines were [illegible]. At the Citadel, Plymouth, new barracks, consisting of two wings

and a central block, have been built and will soon be ready for occupation. At the station hospital the heating of the water for bath and ablution purposes for A, B, and C blocks is said to be defective in the winter months, and the medical officer in charge suggests that a boiler should be placed in each block. *United Kingdom*

At *Exeter*, in the Town Barracks, improvements have been carried out by the provision of cupboards in the barrack-rooms, the laying on of gas to the bedrooms in the married quarters, and by raising the roof of the sergeants' mess. In the Higher Barracks, the hospital and barrack blocks have been repainted. Four new huts, with necessary buildings, including bath accommodation, have been erected at Topsham Barracks. The station hospital is noted as being too small, and the question of increased accommodation is under consideration. In emergencies a barrack-room is equipped and used as a hospital ward.

At *Newport* (*Monmouth*) ventilating pipes have been provided in connection with the w.cs. of the officers' quarters. At the station hospital an extra water closet has been added during the year, and the surface drainage of the mortuary has been completed. The lavatory is stated to be badly lighted.

At *Okehampton* the sanitary condition of the camp is stated to be now satisfactory, the drainage system having been completed during the year.

At *Pembroke Dock* the difficulties experienced in combining warmth and ventilation in the old wooden huts of the barracks and the hospital, which were referred to in the previous year's report, are again commented on; and the building of a new hospital is specially urged. The position of the existing hospital is also stated to be bad, being quite close to a creek, into which a portion of the sewerage of the barracks and hospital is run, and which is said to be very offensive at times. In connection with the barracks a row of new huts has been erected during the year, but complaints are made as to their draughtiness. In the Defensible Barracks a new block of married quarters is in course of erection.

At *Taunton* the drainage was completely remodelled and is now quite satisfactory.

A camp was established on Staddon Heights from 1st May to 17th October. The health of the troops and the sanitary condition of the camp were excellent.

Southern District.

The Principal Medical Officer (Surgeon-General C. McD. Cuffe, C.B., A.M.S.), states that the general health of the troops has been fair, but does not on the whole compare very favourably with the year 1899, for, notwithstanding the fact that a decrease has occurred in the admission and constantly sick rates, the cases under treatment were of a more serious character than they have been for some years previously. Scarlet fever and measles were the principal zymotic diseases, the former accounting for 105 cases amongst the men, 6 amongst the children, and 2 amongst women, and the latter for 42 amongst the men, 51 amongst the children, and 3 amongst women.

There were 42 cases of enteric fever in the district, distributed as follows:—Portsmouth (15), Gosport (15), Hilsea (4), Netley (5), and one each at Portland, Sandown, and Southampton. In no case was the origin clearly traceable and there were no insanitary conditions discoverable except at Grange Camp, Gosport, late in the season, when the camping ground from long use as a standing camp had become more or less foul. It is possible that some of the cases admitted into the Portsmouth and Gosport station hospitals may have originated in this camp. Among new factors influencing the health of the troops, the large number of reservists and re-enlisted men who had already served, and also the embodiment of several militia battalions, are noted. Many of these men were subsequently found unfit to endure the strain put upon them after some years of a comparatively inactive life. Soldiers of militia battalions, many of them old and feeble, who might have gone through an ordinary training, sought relief from subsequent service by

United Kingdom.

reporting sick, and in many cases were discharged as invalids. Much of the disease prevalent is also attributed to over-indulgence in alcoholic stimulants, which was particularly noticeable in old soldiers who had rejoined. Judging from the number who were invalided soon after joining, the Principal Medical Officer considers it advisable to resume the medical examination of men of the Army Reserve either triennially or annually as previously. A very large number of invalids and transfers of sick were received from abroad, chiefly from South Africa; over 33,000 were dealt with at Southampton, and the arrangements made for the disposal of these large numbers worked most smoothly. Depôts were established at Fort Brockhurst and Southampton for the accommodation of those invalids not requiring hospital treatment prior to their proceeding on sick furlough.

The following is a statement of the sanitary conditions and sanitary services carried out at the various stations during the year:—

At *Christchurch* slate shelves were introduced into barrack-room cupboards; the gas supply of the library and reading-rooms was improved; fixed flushing pipes were provided to sinks in married quarters; cupboards were provided for hospital wards and non-commissioned officers' room; and the roof of the covered way to the hospital latrine and ablution-room was glazed.

At *Devizes* the septic tank system for the disposal of a portion of the sewage has been under trial for about eight months and is favourably reported upon.

At *Dorchester* the construction of a porch in front of the hospital has been completed and has proved both useful and ornamental. The dry earth closet of the isolation ward has been replaced by a water closet. A new bath-room has been erected in the R.A. barracks, with hot and cold water laid on. The road leading to the station hospital has been put into proper repair. A donation of gymnastic appliances for the treatment of stiff joints and other affections following gunshot wounds, sprains of muscles, &c., has been given to the hospital and has proved useful.

At *Golden Hill Fort* (J.W.) the unsatisfactory nature of the lavatory and bath arrangements is again referred to. A septic tank system of sewage disposal has been installed at Warden Battery. The installation is described as follows:—The sewage is conducted to a cesspool situated some ten yards from the fort wall on its western aspect. Previous to discharge into the cesspool, the sewage undergoes bacterial fermentation in a specially prepared chamber. The cesspool is cemented in on all sides and is drained into the sea. This arrangement has now been in use about a year. It has required little or no attention and has never given rise to any nuisance.

At *Parkhurst*, four new blocks of barracks are being constructed, also annexes with w.cs. and sculleries to married quarters. The underpinning and repair of a large portion of the station hospital, which the serious cracks in the ceilings and walls rendered necessary, are nearly complete. A large part of the foul drains from the south side of the barracks and hospital has been taken up and renewed, and the drill field has been improved by subsoil drainage.

Portland.—At Fortune's Well, a place of resort as well as residence for some of the officers and men of the garrison, a scheme for improving the sewage disposal and water supply is in contemplation by the local civil authorities. Heating apparatus for the supply of hot water to the ablution-rooms in barracks was provided during the year.

At *Gosport* the drain in connection with the officers' mess at Brockhurst is stated to be defective on account of insufficient fall, and the necessity for more latrine accommodation at Fort Brockhurst, in order to provide for emergencies, is also noted. The means of lighting and ventilation of the prisoners' room at Fort Elson are defective, consisting only of three small windows opening into a subway. The water supply for the married quarters is obtained from a stand-pipe outside; and there are no sinks in the quarters, six in number, so that the occupants find it difficult to maintain adequate cleanliness. The w.c. in the officers' quarters is not supplied with a flushing cistern.

At *Hilsea* defects in the foul drains are being attended to, but so many faults have been discovered that it is in contemplation to reconstruct the whole, or nearly the whole, system.

At *Portsmouth* the general sanitary condition was satisfactory.

At *Southampton* no circumstances in connection with the health of the troops require special mention.

At *Trowbridge* two wooden buildings have been erected, containing sergeants' mess, canteen, coffee-room, recreation-room, and school-room. An additional bath has been provided and hot water laid on to the two now available. Surface drainage has been improved by the laying down of a new brick gutter along the main road inside the barracks.

At *Weymouth* hot water has been laid on to the baths. A recommendation has again been put forward to substitute the water system for the dry earth system latrines. A new canteen and stewards' quarters have been constructed, as well as twenty quarters for married soldiers which will be ready for occupation shortly. The latter are considered to be of much sanitary importance, as hitherto the families have had to occupy unsatisfactory lodgings in the town.

At *Winchester* nothing of importance has been noted in connection with the sanitary conditions of the garrison.

Wool Camp (near Wareham) was for the first time occupied during the year, two battalions in succession being encamped there during the summer for rifle practice. Camping grounds have also been occupied during the year at Puckpool, near Ryde; at Brembridge, Fort Glacis, and Sandown Fort, near Sandown (I.W.); at Haslar, near the Gosport Station Hospital; at a field near Fort Gilkicker (Solent); at Grangefield, near Fort Grange; and at Browndown. The embodied Militia Artillery were encamped near Golden Hill Fort, the Verne Citadel at Portland, and at Southsea Castle; and numbers of tents were pitched on parade grounds and various open spaces within barrack enclosures and forts to relieve overcrowding.

With the exception of Grangefield, already referred to, the health of all the troops under canvas was remarkably good.

Netley.

The Principal Medical Officer (Colonel W. J. Charlton, R.A.M.C.) reports the ventilation as having been fairly satisfactory, the warming good, and the water supply good and sufficient.

The drainage throughout the hospital was defective, but this is being rectified. Defects were also discovered in connection with the flushing of the w.cs., the fittings and pipes of which were destroyed by the chlorinated water produced by the Hermite process. The latrines are also reported to be old fashioned and defective. Four cases of enteric fever occurred, but no definite cause was assigned for the attacks.

No overcrowding occurred during the year. Extra accommodation for invalids from South Africa was provided by the erection of 77 Doecker huts, each having a cubic space of 8,298 cubic feet, and accommodation for 10 men; 43 of these huts were subsequently removed to other stations.

The number of invalids admitted from South Africa has caused a great amount of additional work.

The sanitary condition of the lunatic hospital is reported to be very satisfactory. Of the numbers discharged from this hospital during the year 51 per cent. are noted as recoveries. In 1899 there were 54 per cent. recoveries, and in 1898, 55 per cent.

The total number of invalids from abroad amounted to 10,155, of whom 8,113 were invalids from South Africa, and 2,042 from other stations abroad. Of the latter, 26 died, 247 were discharged to duty, and 560 were invalided from the service.

Of the South African invalids, 69 died during the year, but the full statistics of these invalids are reserved for record at the conclusion of the campaign.

During the year five excellent railway ambulance carriages have been constructed at the works of the London and South Western Railway Company, under the direction and supervision of the War Office, and are fitted with all modern requirements. They are accommodated at Netley and can be requisitioned for service as required (see Appendix IX).

United Kingdom.

These have proved a great boon for the easy transfer of serious cases to Netley and the various general and other large hospitals in England specially organized for the reception of sick and wounded from the South African Field Force.

The extension of the London and South Western Railway line from Netley Station to the back entrance of the Royal Victoria Hospital was also completed during the year, and the sick can now be transferred from hospital on board ship to the hospital wards at Netley with a minimum of discomfort.

Thames District.

The Principal Medical Officer (Lieut.-Colonel U. J. Bourke, R.A.M.C.) reports, as regards the general health of the troops, that the year under review has been a fairly healthy one, and that there was no unusual prevalence of disease. 61 admissions for scarlet fever are shown, most of the cases occurring at Chatham, where the disease was more or less prevalent amongst the civil population. There were 31 cases of enteric fever—officers (1), men (27), women (2), children (1)—distributed as follows:—Chatham 23, Shoeburyness 6, Gravesend 1, Sheerness 1. There was nothing definite to indicate any cause for the attacks, so far as the condition of the barracks, &c., was concerned, but in connection with the cases at Chatham it is noted that there was an outbreak of enteric fever among the civil population of Chatham at Gillingham, New Brompton, and other villages, which was attributed to digging up old drains, cesspools, &c., in the course of laying a new system of drainage and connecting the houses thereto.

The following is a statement on the sanitary conditions, and sanitary services carried out, at the various stations during the year: –

Chatham.—The drainage at the upper portion of Southill Barracks, connected with the officers' mess, kitchen, and gymnasium, has been remodelled, along with other minor improvements in drainage. The old traps in the drainage system of the Brompton Barracks have been replaced by traps of modern design. An operating room and an ophthalmic ward have been added to the station hospital, and improvements have been effected in the ventilation of some of the wards.

Gravesend.—The hospital accommodation is insufficient owing to the increased strength of the garrison. A Thresh's disinfector has been erected in the hospital enclosure. The barrack sewer has been reconstructed.

Maidstone.—The lighting of the married quarters was improved.

Sheerness.—A new cooking apparatus has been provided; the gulley traps to the married quarters have been renewed, and the ceilings in the ablution-rooms, guard-rooms, and cook-house have been repaired. Gas fittings have been provided to the provost cells.

Shoeburyness.—Thirty-two new married quarters have been completed at the Camp Field and are now fully occupied. A similar block, to replace the married quarters in barracks, is considered desirable. The latter are not considered up to modern requirements, and do not afford sufficient accommodation. The drainage system of the Staff Officers' quarters, the Military Foreman of Works' quarters, and the Royal Engineer Yard has been relaid. Quarters for the Quarter-Master, School of Gunnery, have been completed; and at Camp Field the officers' latrines are in course of reconstruction. The children's school is reported to be overcrowded, and new school buildings and accessories are stated to be urgently required. An additional sewage tank on the beach is in course of construction.

South-Eastern District.

The Principal Medical Officer (Colonel H. Comerford, M.D., R.A.M.C.) reports that the general health of the troops has been good, and the sanitary condition of the several barracks in the district satisfactory. In addition to

the ordinary sick of the troops stationed in this district, 1,147 invalids from South Africa were transferred direct from ports of disembarkation to the station hospital at Shorncliffe during the year, the accommodation having been increased by 122 beds in the Beach Rocks, Convalescent Home, Sandgate, which was specially hired by the War Department as a temporary section of the station hospital, Shorncliffe. The principal zymotic diseases were measles and scarlet fever, the former being represented by 60 admissions amongst the men, 2 amongst women, and 66 amongst the children, and the latter by 21 admissions amongst the men, and 9 amongst the children. Shorncliffe, Canterbury, Dover, and Chichester accounted for the majority of these cases. There were 12 cases of enteric fever—6 at Dover, 4 at Canterbury, and 2 at Brighton. The probable cause of three of the Dover cases is stated to be infection from one of their comrades who contracted the disease in London; and as regards three of the Canterbury cases, the opening up of defective drains in the cavalry barracks is cited as a possible cause. Ten cases of diphtheria occurred at Shorncliffe, the origin of which is reported to have been probably due to defective drainage in the Napier Barracks. An outbreak of tonsillitis at Shorncliffe is attributed by the Principal Medical Officer to foul air from a defective drain getting into the barrack-rooms through inlet ventilators which are protected by mica valves, many of which were broken when he visited the station during the outbreak. The cases of tonsillitis ceased after the offensive drain and ventilators were attended to. *United Kingdom.*

The following is a summary of the sanitary conditions and improvements at the several stations:—

Brighton.—New bath and ablution rooms are now being fitted with hot and cold water apparatus; hitherto hot water for baths was obtained from the adjoining kitchens. Roadside gutters have been renewed.

Canterbury.—A new isolation block was opened towards the end of the year, consisting of two three-bedded wards with accessories. The backyard of the canteen in the artillery barracks was paved with concrete. The surface drainage is said to be defective in the vicinity of the barracks, but steps have been taken to remedy this. The defective drainage in the cavalry barracks, to which the enteric fever cases were ascribed, was remedied.

Chichester.—The principal sanitary services carried out during the year were:—The provision of a bath-house with hot water supply, renewal of surface gutters and drains at the station hospital, and the construction of a new floor and improvement in the lighting of the gymnasium. A disinfecting apparatus is required at this station, as it is stated that there is none even for civil purposes in Chichester.

Dover Castle.—The barrack-rooms in the old Cliff casemates are reported as being dark, and gaslight is required in the daytime. Ventilation is carried on by shafts, and is stated to be faulty, but the health of the occupants has been very good. The barrack-rooms in the keep are gloomy, but the ventilation is good. The stone huts at the north end of the castle are stated to be satisfactory, and extension of such accommodation is recommended in place of the casemates. At Fort Burgoyne the casemates are reported to be fairly well lighted and ventilated, but they are damp in winter, and are rarely occupied during that period of the year. The following sanitary improvements were effected during the year:—Water supply to latrines in keep yard improved; better flushing arrangements in Spur casemates; improvement and extension of latrine accommodation in married quarters; enlargement of ground floor windows in married quarters, King's Gate; and urinals provided for non-commissioned officers in Fort Burgoyne.

At *Western Heights* the general sanitary condition is reported as satisfactory. During the year improvement and addition to the married quarters, Grand Shaft Barracks, were carried out, and in the Citadel casemates mullion windows were substituted for port-holes.

Eastbourne.—Thirty convalescent patients, mostly from London, were transferred to the hospital during the year, and almost all derived great benefit from the change. Some defects are noted in connection with the married quarters in Ordnance Yard.

At *Hythe* the general sanitary condition is satisfactory.

United Kingdom.

Shorncliffe.—Defective drainage at Napier Barracks was remedied; and the fittings to the men's latrines at the station hospital were renewed. The medical officer in charge of the station hospital reports that a moist heat disinfecting apparatus, wards for lunatics and prisoners, and a guard-room are urgently required.

Home District.

The Principal Medical Officer (Colonel Sir T. J. Gallwey, M.D., K.C.M.G., C.B., R.A.M.C.) remarks that the general health of the troops was satisfactory, although the death rate was somewhat in excess of that of the previous year and of the average rate. The principal zymotic diseases were measles and scarlet fever, the former (including rubella) accounting for 110 cases amongst the men, 6 amongst the women and 163 amongst the children, and the latter 53 cases amongst the men, 2 amongst the women and 8 amongst the children. Diphtheria caused 10 admissions amongst the men, 1 amongst the women and 7 amongst the children. There were 11 cases of enteric fever—men (8), women (2), children (1)—all in London. No definite cause could be assigned for the attacks, but the disease was prevalent amongst the civil population.

At *Caterham* the sanitary condition of the barracks is reported as having been satisfactory. The parade ground is still damp in places, but much has been done to improve it.

At *Guildford* the medical officer in charge reports that the drinking water cisterns on the barrack roofs are liable to contamination, and that taps leading direct from the main are, therefore, much needed. The necessity of a reception-room for men coming up for enlistment is also noted. In the married quarters no fire-places are provided in the bedrooms, and they are stated to be very cold and damp in winter. The drainage of the barracks is to be connected with the main drainage system of Guildford, thus doing away with the sewage farm hitherto used in connection with the barrack sewage.

At *Hounslow* the warming of the hospital is stated to be unsatisfactory owing to defects in the stoves. Only temporary improvement has resulted from the measures adopted to remedy the defects.

At *Kingston-on-Thames* the medical officer in charge considers that there is not a sufficient fall in the drains. He attributes the excessive dampness in the barracks and hospital and the prevalence of sore throat to this cause. Amongst the sanitary improvements effected during the year are the relaying and ventilation of the drains in various quarters, and the provision of gas to the bedrooms of the married soldiers' quarters.

At *Regent's Park Barracks* and *Hyde Park Barracks*, occupied during the year by the 2nd Life Guards and Royal Horse Guards respectively, no sanitary defects or improvements are noted.

The sanitary condition of the barracks, *London, S. W.*, is generally reported to be satisfactory. The urgent need of additional and suitable hospital accommodation is again strongly emphasized. No isolated building exists for infectious cases, and the general wards in the main building have at times to be temporarily appropriated for them. It is also noted that dining-rooms, day-rooms, ophthalmic wards, and additional bath-rooms are greatly needed.

At the *Tower of London* the sanitary conditions generally are considered satisfactory. The medical officer in charge notes that the married quarters require more light.

At *St. John's Wood* windows have been provided for the better lighting of the pack store at the hospital.

At *Oxford* there is no tank for the storage of drinking water for the

barrack huts, or for the proper flushing of the latrines belonging to these huts. As the water supply is said to be turned on only for half an hour twice daily, water for drinking purposes, &c., is kept in cans on the table of each barrack-room, and there is consequently some difficulty also in keeping the latrines in a good sanitary state. New baths with hot water supply have been provided in barracks. In connection with the drainage the ventilation has been improved by ventilating shafts, and in many places the drainage has been relaid and inspection pits provided. It is noted that the hot water supply to the hospital ward annexes is not constant, owing to the insufficiency of fuel. A bath, w.c., and urinal have been supplied to the hospital hut. *United Kingdom.*

At *Reading* the surface drains have been repaired.

At *Windsor* the condition of the station hospital is reported to be most unsatisfactory, the building being structurally unsafe. The barrack-room is in a bad condition, and when rain is heavy the wet comes through the walls. No isolation wards exist, and infectious cases have, therefore, to be treated in wards in the main building temporarily appropriated for the purpose, cases amongst women and children being isolated in barracks. There is no civil isolation at Windsor, and the necessity for a suitable building is consequently urgent.

Woolwich District.

The Principal Medical Officer (Lieut.-Colonel U. J. Bourke, R.A.M.C.), reports that during the year the health of the troops has been good, and the sanitary condition of barracks satisfactory.

There were 38 cases of measles amongst the men, 3 amongst the officers, and 77 amongst the children. Scarlet fever accounted for 14 cases amongst the men, and 22 amongst the children. Six cases of enteric fever occurred (5 amongst the men, and 1 amongst the women), but in none of them could the origin be traced. There were also 24 admissions for diphtheria (9 men, 1 woman, and 14 children), but it is noted that their occurrence could not be traced to any insanitary condition in the barracks.

A few minor sanitary improvements were carried out, but none of importance. Hot water is not yet supplied to the bath-rooms in the Shrapnel, Cambridge, or Red Barracks. "G" block, Herbert Hospital, which was formerly appropriated for cases of infectious disease, was reappropriated for general use. The wards were painted throughout and hot water laid on. The old operating theatre has been reconstructed, the walls painted, a new floor of vitreous cement laid down, hot water pipes with three radiators put in, and the lighting improved by an additional window. The mortuary, hitherto under the operating theatre, has been removed to an iron structure in the grounds. "A" upper south and "A" lower south wards have been painted during the year; and the lighting in "G" and "A" blocks has been improved by means of generative burners. The cooking accommodation has been increased by the addition of two Deane's gas ovens.

Eighteen corrugated iron huts, for twenty patients each, have been erected in the hospital grounds for the accommodation of invalids from South Africa; and arrangements have been made for the accommodation of infectious diseases in the adjoining hospital of the Metropolitan Asylums Board.

The total number of invalids from abroad amounted to 5,643, of whom 5,264 were invalids from South Africa, and 379 from other stations abroad. Of the latter 5 died, 257 were discharged to duty, and 84 were invalided from the service. Of the South African invalids, 17 died during the year, but the full statistics of these invalids are reserved for record at the conclusion of the campaign.

At the *Royal Military Academy* two large corrugated iron huts were erected in order to afford increased hospital accommodation, and the need of another similar hut for infectious cases has been represented.

Aldershot.

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The Principal Medical Officer (Surgeon-General T. F. O'Dwyer, M.D., A.M.S.), remarks that if the health statistics are compared with former years, the figures this year are very unsatisfactory. The garrison was composed to a great extent of Militia and Royal Reserve Regiments, many of them old and broken-down men who would have been pronounced unfit for the service. Several weakly young soldiers were left behind by regiments that proceeded to South Africa, and there was a steady stream of men from that country broken down in health or disabled by wounds who joined units on return from sick furlough. A further disadvantage under which the troops laboured for some time was overcrowding; and there was a deficiency of trained and experienced Army Medical Officers and an efficient subordinate hospital staff, especially as regards non-commissioned officers.

Scarlet fever was rarely absent from camp, and was repeatedly introduced by arrivals at the station. It and measles caused some difficulty in the despatch of drafts to South Africa. There were only five cases of diphtheria among soldiers, and three among children, a great contrast to the state of things in former years. The town of Aldershot, too, was comparatively free from that disease, and this is said to be connected to some extent with the recent erection of an isolation hospital and the appointment of a properly qualified medical officer of health, who devotes his whole time to preventive medicine. Any infectious disease that prevails in the town extends to the troops; and as so many men mobilize here for war and proceed on foreign service, anything that improves the health of the citizens must be beneficial to the camp. In the North Camp matters are not so satisfactory; for there is no isolation hospital for the civil population of Farnborough, and the medical officer of health is not specially qualified as a sanitary officer and is engaged in private practice.

The sanitary condition of the Aldershot barracks is on the whole satisfactory.

Not much has been done in the chemical and bacteriological laboratory, as no operator was available during the greater part of the year. The room for the X rays has been fitted up in a satisfactory manner, and has proved most opportune for the large body of wounded soldiers who arrived from South Africa. Four camps for troops for one brigade division Royal Field Artillery at Ewshot, two brigade divisions Royal Field Artillery at Deepcut, and for two battalions at Blackdown and Chobham Ridges; for two battalions and a hospital at Borden and Woolmer, and at Longmoor (Woolmer) for two battalions, have been erected, or partly erected. All camps are not yet complete, although one is completely occupied and one partly occupied by troops.

In addition to the ordinary sick of the troops stationed at Aldershot, 1,815 invalids from South Africa were transferred direct from ports of disembarkation to the Cambridge and Connaught Hospitals during the year, the accommodation having been increased by 680 beds in wooden huts.

The following requirements and improvements have been noted during the year:—

Better lighting is required in the barrack-rooms. This will be done when the electric light, which has been sanctioned, is supplied. Drying-rooms for soldiers' clothes are required. The condition of the roads and ground about the barracks has been much improved, but there is still a great deal to be done in that direction. An attempt is to be made to heat some of the school-rooms and passages with oil stoves. There has so far been no improvement in the ventilation of the old married quarters, except in a few isolated instances. A quarter for the medical officer in charge of the Cambridge Hospital, near the hospital, has been approved, and one is much wanted for the medical officer in charge of the Connaught Hospital. A new hospital to replace the 3rd Station Hospital is much needed. The hospital is now mostly composed of old wooden huts. Wooden huts for 520 patients at the Connaught Hospital and for 160 patients at the Cambridge have been provided to accommodate invalids from South Africa. The camp sewage

farm is much improved, and no nuisance has been reported in connection with it during the year. The gas supply to barracks in Wellington Lines has been improved. Extra quarters for soldiers' families are being erected in Wellington Lines. Additional temporary accommodation for 32 sick in two wooden huts has been provided at the isolation hospital. A ward for officers suffering from infectious disease is much required there. The building of a new supply depôt and abattoir has been commenced. Double doors have been put up to the wards of the Connaught Hospital, and a new swimming bath for the troops in the camp is approaching completion. This will be a great boon, as the canal in summer is not well adapted for bathing. A laundry and bath-house is being built for the cavalry barracks. *United Kingdom.*

At *Woking* barracks drainage has been improved, and a laundry has been built. The effect of gymnastic training on the health and development of the soldier has been very beneficial.

Channel Islands.

The Senior Medical Officer (Lieutenant-Colonel R. Batho, M.D., R.P.) reports that the general health of the troops constituting the garrison of the Channel Islands during the year was satisfactory.

Alderney.—In Fort Albert the flushing-out arrangements in the urinals are said to be unsatisfactory; in Fort Tourgis the old and unsatisfactory latrines are being replaced by new ones.

At *Guernsey* an improved system of drainage has been installed, and a new latrine, &c., erected at Castle Cornet. The old system of latrines and drains at Fort Hommet have been abolished, and more modern conveniences have been erected and drain relaid. Two new married quarters have also been erected during the year. An isolation ward for the reception of infectious cases and a disinfecting apparatus are noted as being much needed.

In *Jersey*, at Fort Regent, a hot water service has been supplied to the bath in the men's ablution-room, and also to the hospital bath; means of warming have been provided for the provost cells. The annexes to the married quarters in Green Street have been completed. At Elizabeth Castle the latrines for non-commissioned officers and men have been renewed and improved. A new earth closet has been erected at the officers' quarters, St. Peter's Barracks. At both the station hospitals, Fort Regent and St. Peter's, the need of a ward for infectious diseases and a disinfecting apparatus are noted.

Scottish District.

The Principal Medical Officer (Colonel J. P. Rooney, R.A.M.C.) reports that the health of the troops and the sanitary conditions were satisfactory during the year. Temporary overcrowding, consequent on the mobilization of the troops, occurred during a portion of the year, but no ill effects appear to have resulted. Improvements have been made at various stations in bath accommodation, provision of water closets, &c., during the year, but the ventilation in barracks remains much as it was in the previous year. Measles accounted for 12 admissions amongst the men, 2 amongst the women, and 150 amongst the children; the stations principally affected being Edinburgh, Fort George, Hamilton, Inverness, Maryhill and Leith Fort. Scarlet fever gave 43 admissions amongst the men, 1 amongst the women and 13 amongst the children; the majority of cases occurring at Edinburgh, Aberdeen, and Maryhill. Of the ten cases of enteric fever

United Kingdom.

—Maryhill (6), Barry Camp (2), Ayr (1), Fort George (1)—5 were probably due to defective drainage in barracks at Maryhill, but no cause is assigned for the others. For diphtheria 10 admissions are also recorded, 8 of which occurred at Maryhill. The following is a summary of the sanitary conditions reported from the several stations:—

Aberdeen.—Improvement has been made in altering the position of the baths so as to gain more light, and a stove has been placed in the gymnasium. There was an insufficiency of latrine accommodation for the number of troops. A temporary arrangement was made pending new constructions.

Ayr.—Stoves were provided in the gymnasium.

At *Berwick-on-Tweed* the baths have been improved and hot water supplied.

Barry and Buddon Camps.—The condition of these camps is reported to be satisfactory on the whole, but an efficient system of drainage and a drying-room is required for the former. The sick of both camps are treated on the spot, but cases requiring dieting and special nursing are sent to Dundee or Perth.

Edinburgh Castle.—The reconstruction of the drainage was completed in the early part of the year and is now satisfactory. Additional baths with hot water have been provided, but more bath accommodation is still needed. A new gymnasium has recently been completed. Many of the old-fashioned grates still remain in the barrack-rooms; they are wasteful and inefficient for warming. The new hospital is very satisfactory and comfortable; with an increased fuel issue the warming of the wards in the winter months has been satisfactory. The ventilation of the water closets in the hired married quarters of Castle Wynd is said to be defective.

At *Leith Fort* the conditions generally were satisfactory.

At *Piershill* improvement in the drainage has been effected and some new drains laid; additional baths have been provided in the west block, soap and towels being provided free of cost.

At *Fort George* a new water supply, which is of good quality, has been provided. It is brought in from a well, fitted with pumping gear, some 1,000 yards distant in a south-easterly direction, on the common. Improvement has been made in the ventilating and lighting of the casemates. A building called the Ravelin Guard House, in an isolated position, has been used for infectious cases, and is considered suitable for the purpose.

At *Maryhill* the sanitary conditions have been fairly satisfactory, with the exception of the Melville block, which in a period of ten days during the month of May gave five admissions for enteric fever, all from one room; the block was vacated and the drainage was found to be defective, the drains being choked, ill constructed and out of repair. The necessary alterations were carried out, and a scheme for extensive reconstruction was subsequently submitted.

At *Glencorse* new water closets have been added to the married quarters. The biological filtration plots have not worked well, and the sewage now runs into a septic tank, the flow into the filter beds being thus regulated.

Hamilton.—New baths have been provided, and it was recommended that the old baths for the huts be reconstructed. The gymnasium has been supplied with a stove and wooden floors, and the new kitchen for E block has been reconstructed.

At *Inverness* the conditions are satisfactory, hot water is laid on to the baths, and some minor improvements have been effected in the hospital.

Perth.—The sanitary condition was satisfactory.

Stirling.—Extra bath accommodation, with hot and cold water laid on, has been provided, and improvement in officers' water closets effected by conversion to the flush-out system. At the hospital the want of a modern annexe to the wards is still felt. The rain pipes from the roof connected with the sewer were disconnected and trapped.

Dunbar.—The barrack drainage was renewed.

Montrose.—The barracks, &c., were improved, drainage reconstructed, new baths and better latrine accommodation supplied, and cells and guard-room improved. The ventilation of the barrack is defective owing to faulty construction. The non-dieted hospital is in process of enlargement and improvement; bath, water closets, store, surgery, kitchen and isolation ward being added.

Belfast District.

The Principal Medical Officer (Lieut.-Colonel R. G. Thomsett, R.A.M.C.) reports that the general health of the troops in the Belfast district during the year was fairly good There was no prevalence of any particular disease, and the admissions for venereal disease were lower than usual. This diminution is particularly marked in reference to Belfast and Holywood, where the ratios of admission for venereal for the present year amount to 233·6 and 86·3 per 1,000 respectively, as compared with 302·7 and 295·8 in the previous year, and with 270·7 and 295·5 in 1898. The Principal Medical Officer is of opinion that this is in a great measure due to the fact of so many old soldiers (Reserve Battalion) being employed during the year, the greater number of whom were married. Scarlet fever gave 10 admissions, equally divided between the men and children, and there were 21 admissions for enteric fever, including 1 amongst the women. The enteric fever cases occurred at Finner Camp (9), Belfast (6), Holywood (4), Armagh (1) and Enniskillen (1), but none of them were traced to any insanitary condition of barracks. With regard to the cases at Finner Camp, a careful investigation disclosed no insanitary condition of the camp. The dry earth system of latrines was in use and worked satisfactorily, and the water supply was good, the latter fact being confirmed by examination at Netley. It was believed, therefore, that the source of the disease was the neighbouring villages, where enteric fever was known to have existed. In connection with the Belfast cases it is noted that enteric fever in Belfast City assumes at times an epidemic form. As regards Holywood it is stated that there was no prevailing disease in the town, and the Principal Medical Officer is of opinion that the cases at this station were caused by eating shell-fish found on the foreshore, which is contaminated with sewage. In recording the fact that again (as in the previous two years) there were no cases of diphtheria in the Belfast Garrison, the Principal Medical Officer remarks that an efficient system of drainage in the Victoria Barracks has no doubt acted beneficially with special reference to this disease. *United Kingdom.*

At *Armagh* the general sanitary condition of barracks, &c., has been satisfactory; extra ventilation to the guard-room and cells has been afforded. The hospital is old and defective in structure.

At *Belfast* the dairies supplying milk to the troops are reported to be in good sanitary condition, and the milk has been frequently and at uncertain times tested, and found to be sweet and to contain a percentage of cream. Among the improvements made or completed during the year may be mentioned (*a*) a hot water supply for eight baths for the infantry barracks; (*b*) a water supply for the cavalry cookhouse; (*c*) a block of new married quarters, double-storied, completed and occupied; (*d*) three small wards in the station hospital, cemented and enamelled. It is considered that the infectious building is not large enough for requirements, and that urinals might with advantage be placed in the barrack-rooms.

At *Dundalk* there was occasionally some overcrowding during the year, which, however, was obviated by pitching tents. An isolation ward is still required; the arrangement whereby the hospital can be used for infectious cases, barrack-rooms being used for ordinary cases, is not considered satisfactory. The construction of a foul linen store and of flush-down w.cs. has been recommended.

At *Enniskillen* the general sanitary condition has been good. A hot water supply for the barrack bath-room is needed, and the number of baths is scarcely sufficient. An ophthalmic ward in the hospital is desirable.

At *Holywood* there is no hot water supply in the barrack bath-rooms, and it has to be brought from the cookhouse when required. An ophthalmic ward in the hospital is considered desirable.

At *Londonderry* the general sanitary condition of barracks has been satisfactory. A hot water supply is laid on to the baths, but a fixed bath with suitable arrangement for hot and cold water in the isolation ward is considered desirable. The need of an ophthalmic ward in the hospital is noted.

United Kingdom.

At *Newry* the hospital appears to be very old and not very suitable for the purpose. A larger infectious ward is needed, also an indoor w.c. for patients' use. The barracks are old and the corridors have occasionally to be utilized to prevent overcrowding. Accommodation for married families is desirable to obviate the occupation of lodgings in the town, which, owing to surroundings, are, in some cases, not in good sanitary condition. A hot water supply for the baths is desirable, also a drying-room attached to the women's wash-house. Some of the officers' quarters are not supplied with w.cs., and there is also a want of means for supplying hot water to the officers' kitchens.

At *Omagh* the sanitary condition has been satisfactory. The conservancy in barracks is on the dry earth system, while the hospital and officer's quarters have the ordinary w.cs. The water supply is from a reservoir about three miles distant conveyed by pipes. There is a filter of rubble, sand and charcoal attached to the well used by the married families.

At *Belturbet* the surface drainage has been improved and additional accommodation made by the erection of two zinc-roofed huts, which are suitable. A hot water supply in the men's baths and a small gymnasium would be of advantage.

At *Drogheda* it is noted that the prisoners' room requires more ventilation, and that some of the barrack-room walls require renewing.

At *Finner Camp, Ballyshannon*, there was a large camp formed during the year, accommodating about 3,500 men, which was well laid out, and there was no overcrowding. The water supply, which was good and ample, was obtained from springs and distributed to the camp by metal-pipes and stand-pipes. The drainage and all other sanitary arrangements were satisfactory.

Dublin District.

The Principal Medical Officer (Surgeon-General A. F. Preston, M.B., A.M.S.), reports that the sanitary condition of the Dublin district has been generally satisfactory. In some few cases the surroundings of the barracks were bad, but the health of the troops does not appear to have been injuriously affected thereby. The accommodation generally has been sufficient.

The following are the chief points noted in connection with the sanitary improvements and defects in the several stations of the district:—

At *Athlone* the lighting and ventilation of the barracks are not of the best, and the whole place wants bringing up to date. The accommodation for the Royal Artillery is hardly sufficient for the batteries when up to their full strength, and there is consequently some overcrowding at times. The ventilation of the married quarters, cells, and guard-room has been improved during the year, a new latrine and urinal provided for the infants' school, and water laid on to the married quarters, The latrine system (McFarlane's) is to be replaced by Jennings's during 1901.

Birr.—The drainage and sanitary conditions in the immediate neighbourhood of the barracks are indifferent. The remodelling of the drainage system of the barracks was completed during the year. Some defective surface drains were taken up and relaid; a well, the water of which was suspected of sewage contamination, was cleared out and protected, and the filter beds of the sewage farm cleaned. Stands were provided for the urine tubs in the barrack-rooms; an objectionable urinal was removed from the wash-house, and the drainage of the floor of the cookhouse rearranged.

At *Castlebar*, sinks, with water supply for cisterns, were provided in the hospital kitchen cookhouses, and officers' and sergeants' mess kitchens; also an additional bath in the ablution-room.

In *Dublin* at the Royal Barracks an improvement was made in the ventilation of the prisoners' room. A recommendation was also put

forward for hot water to be laid on to the long baths in the women's ablution-room. At Marlborough Barracks also a similar improvement regarding the ventilation of the prisoners' room was carried out; at Ship Street Barracks an objectionable latrine was removed, and hot water laid on to men's baths; at Island Bridge Barracks the defective drainage system has been entirely reconstructed, and it is now in a satisfactory state; at Portobello Barracks a large new block of barracks was taken over from the contractors during the year, together with two blocks of married quarters. These have been occupied, and found satisfactory in every way. The old blocks are to be reconstructed, and the station hospital is to be evacuated on the 1st May next for the same purpose; the main approach to these barracks has been improved, also the lighting; hot water has been laid on to the baths, and the ventilation of the prisoners' room improved. At Richmond Barracks the medical officer again complains of the absence of water taps and sinks on the landings of the married quarters and thinks these wants do not conduce to cleanliness. The Principal Medical Officer concurs and has represented the matter, with a view to their provision in connection with the next estimates. At the Royal Infirmary, a w.c. for the officers was provided, and the baths and w.cs. generally are to be entirely overhauled during 1901. A new mortuary is to be built on another site and the old one converted into a foul linen store. At Royal Magazine Fort a new ablution-room is to be constructed for the men, and a wash-house from the married quarters. A portion of the foul drainage system is also to be reconstructed, and the w.c. apparatus is to be renewed. *United Kingdom.*

At *Galway* water was laid on to the married quarters during the year; some slop sinks were added and more will be provided during 1901. A urinal and two w.cs. were renewed, and some defective drains in the hospital relaid.

At *Longford* a force pump and stand with supply pipes to the wells were provided; hot water has now been laid on to the baths. With regard to a complaint of the medical officer as to the insanitary state of the well in the vicinity of the hospital, the Principal Medical Officer remarks that the improvement of the drainage and water supply of Longford Barracks is to be commenced in 1901.

At *Mullingar* hot water has been laid on to the baths in barracks, minor improvements and extensions have been made in the married quarters, and the ventilation in the guard-room has been improved.

At *Naas* there was some temporary overcrowding owing to the influx of reservists. The allowance of coal is said to have been insufficient in the cold weather. The water supply is indifferent in summer, and its distribution is unsatisfactory. It is proposed to have the supply laid on from the Urban Council's main, and the water is being tested with that object.

At *Wicklow* a fumigating store is being provided; also a bath-room for the recruits.

Cork District.

The Principal Medical Officer (Colonel J. McNamara, M.D., R.A.M.C.) reports that the general health of the troops in the district, during the year, was good. An epidemic of scarlet fever appeared in Cork Harbour, said to have been introduced by a detachment of the Wiltshire Regiment; there were also 13 admissions for diphtheria and 9 for enteric fever in the district. The cases of enteric fever occurred at Limerick (4), Templemore (2), Queenstown (1), Fermoy (1), Tipperary (1). No definite cause is assigned for any of the attacks, but three of the cases at Limerick are stated to have probably been contracted at Pontefract. The case at Tipperary was a deserter apprehended at Waterford, where he had been living in lodgings. The admissions for diphtheria occurred at Kilkenny (8) and Ballincollig (5). Those at the former station were all contracted in the town, where the disease was said to be epidemic.

United Kingdom.

The following sanitary notes are compiled from the reports on the various stations in the district :—

At *Ballincollig* the ablution and bath-rooms are old, cold, and cheerless, with stone floors, and the barracks are noted for reconstruction.

At *Bere Island* huts have been built, and married quarters are in course of construction.

At *Buttevant* the sanitary condition of the barracks is reported to be good. The water supply is from a well, which is now pumped up by steam power.

At *Cahir* the barracks are reported to be in a good sanitary state. Additional huts are being erected, and extra hospital accommodation has been asked for. The bath-rooms have had hot water laid on recently.

At *Clonmel* the general sanitary condition was good. A gymnasium was built during the year, and two rooms were added to the sergeants' mess. Hot water was laid on in the hospital.

In *Cork* a new block of married quarters was completed during the year. Eight bath-rooms with hot and cold water supply have been constructed for the men. The drainage of the barracks is noted as of obsolete pattern and requires ventilation and trapping. This is under consideration. The hospital is old-fashioned and does not give sufficient accommodation.

The general sanitation of *Cork Harbour* has been good. The water supply is being improved; hot and cold water baths are being erected at Fort Westmoreland; married quarters are being erected outside Fort Carlisle; the prisoners' room and cells have been heated by hot water pipes, and the baths have had hot water laid on. The means for conveying the sick to the station hospital from the various stations in the harbour are reported to be faulty, necessitating exposure during the winter, there being no ambulance boat. There is no infectious diseases hospital, nor apparatus for disinfecting by moist heat; and both are stated to be much required.

The barracks at *Fermoy* are well situated, and are occupied by infantry and field artillery. Additional huts are being erected. The drainage is reported to be in good sanitary condition. An infectious diseases hospital has been erected, and a disinfecting establishment is in course of construction.

At *Kilkenny* new huts are being erected.

The sanitation of *Limerick* is reported to be good. Hot water is laid on to the baths in the new barracks.

At *Templemore* there has been no material change in the sanitary arrangements, which were very satisfactory.

At *Tipperary* the sewage nitrification tanks have worked satisfactorily.

At *Tralee* the barracks were in good repair, and there has been no new service.

At *Waterford* the cells are reported as being badly heated and ventilated.

At *Clogheen* and *Fethard* huts are being erected, and hospital accommodation for both these stations is under consideration.

At *Kilworth Camp* the hospital accommodation is in tents, and serious cases of sickness are sent to Fermoy. It has been represented that a hut should be erected for hospital use, which would enable more cases being treated locally, the hospital accommodation at Fermoy being limited. It is also recommended that the floors of the ablution-rooms and latrines at this camp should be concreted, and that the surface drains be similarly treated.

Curragh District.

The general health of the troops is reported by the Senior Medical Officer (Lieut.-Colonel H. H. Stokes, M.B., R.A.M.C.) to have been good during the year.

Of contagious and infectious diseases there were 7 cases of measles, 1 of scarlet fever, and 3 of enteric fever among the troops.

An epidemic of measles occurred among the children, 112 cases being recorded.

At the *Curragh Camp* the reconstruction of the camp continues. A large swimming bath was completed during the year, also the infant school, Royal Engineers and Army Service Corps married quarters, Royal Engineers barracks, mobilization stores for Ponsonby Barracks, Stewart and Beresford Barracks. G and H squares are in process of demolition to make room for the new Gough and Keane Barracks. The reconstruction of the sewage farm, including bacteria beds, is now in hand, and is expected to be completed by July, 1901; the drainage of the camp is, on the whole, satisfactory, and new drains are being made as the reconstruction of the camp proceeds. The water supply is obtained from springs in the Wicklow mountains, brought to the camp by pipes, collected in reservoirs and distributed by means of pipes; it is stated to be of good quality and fit for drinking. The station hospital has been considerably improved in appearance by repainting of several wards and rendering of the main corridor with Duresco. The foul linen store and company store are being enlarged, and a new boiler for heating purposes has been provided. With regard to this the Senior Medical Officer remarks that a large central boiler would be more advantageous than the small separate boilers now in use for supplying hot water to baths. A moist heat disinfecting apparatus has been established and is working satisfactorily.

Newbridge.—The reconstruction of these barracks is about to take place. The wooden huts and stables are described as very unsatisfactory. The drainage, depending for the most part on surface drains, is stated to be unsatisfactory, but as the reconstruction of barracks is in hand the drainage is to receive immediate attention. The water supply is obtained from a deep well inside the barrack wall and is pumped by steam power into a distributing cistern. It is of good quality.

Kildare.—New hut barracks are being built and will be completed during 1901.

III.—ON THE HEALTH OF THE TROOPS SERVING IN GIBRALTAR.

Sickness and Mortality.

Gibraltar. The average strength of the warrant officers, non-commissioned officers and men serving in Gibraltar during the year was 4,858.

The troops stationed there throughout the year were Nos. 11, 18, 19, and 20 Companies of the Eastern Division and Nos. 10 and 26 Companies of the Southern Division, Royal Garrison Artillery; 2 Companies of the Royal Engineers; the 3rd Battalion Royal Fusiliers and the 2nd Battalion Cameron Highlanders; and detachments of the Army Service Corps, Royal Army Medical Corps, Army Ordnance Corps, Army Pay Corps and Garrison Staff.

The arrivals during the year consisted of No. 32 Company Southern Division, Royal Garrison Artillery, in January and the 1st Battalion Royal Berkshire Regiment in February from England.

The troops leaving the Command were No. 2 Company, Southern Division, Royal Garrison Artillery for South Africa, in January, and the 1st Battalion South Staffordshire Regiment with detachments of Royal Highlanders and Argyll and Sutherland Highlanders for England in February.

The following table shows the admission, mortality and invaliding rates, &c., among the troops forming the garrison :—

1900 Average Strength.	Admissions.	Deaths.			Invalids.		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
4,858	2,573	23	1	24	102	59	180·37	529·6	4·94	21·00	12·15	37·13

Comparing the ratios for the Command with those for the previous year and with the average ratios for the preceding ten years, the admission rate is lower by 92·7 and 212·3, and the constantly sick rate by 3·44 and 13·39, while the death rate is higher than in 1899 by ·28 and than the average rate by 1·32.

The average sick time to each soldier was 13·55 days, which is less than in 1899 and than the decennial average period by 1·26 and 4·89 days respectively. The average duration of each case of sickness, 25·59 days, is longer than in the previous year by 1·79 days and than the average period by ·74 of a day.

In Abstract XXIX is a table showing these health statistics for the several regiments and corps which served at Gibraltar during the year. In the Royal Artillery the highest admission rate, 684·7 per 1,000, was in No. 32 Company, Southern Division, and the lowest, 259·4 per 1,000, in No. 18 Company, Eastern Division. The highest rate of constant inefficiency through sickness was 46·65 per 1,000 in No. 32 Company, Southern Division, and the lowest 20·21 per 1,000 in No. 18 Company, Eastern Division.

For the Royal Artillery as a whole the admission and constantly sick rates were 438·6 and 33·63 per 1,000, while the corresponding ratios for the Royal Engineers were 419·3 and 24·71 per 1,000, and for the Infantry 604·9 and

41·73 per 1,000. The highest admission and constantly sick rates amongst the Infantry, excluding the 1st South Staffordshire Regiment, which was only one month in the Command, were in the 2nd Battalion Cameron Highlanders with 707·0 and 45·85 per 1,000 respectively; the lowest admission rate was 492·5 per 1,000 in the 3rd Battalion Royal Fusiliers, and the lowest constantly sick rate 37·34 per 1,000 in the 1st Battalion Royal Berkshire Regiment. The admission and constantly sick rates among the various corps comprising the Garrison Staff and Departments were comparatively low. *Gibraltar*

With reference to the influence of age on the sickness and mortality, the admission ratio was 600·9 per 1,000 among men under 20 years of age, 656·1 among men between 20 and 25 years, among men between 25 and 30 years 367·3, among men between 30 and 35 288·8, and among men over 35 years of age 380·0. There were 2 deaths, or 2·13 per 1,000, among men under 20 years of age, 12, or 5·70 per 1,000, among men between 20 and 25 years, 4, or 3·46 per 1,000, among men between 25 and 30 years, and 5, or 9·82 per 1,000, among men between 30 and 35 years of age, no death occurring in men over 35 years of age. The corresponding ratios in 1899 were 5·35, 2·14, 4·99, 12·62 and 7·46 respectively.

As to service in the command, the admission rate was highest, 758·0 per 1,000, among men in their first year, falling to 325·7 per 1,000 among those in their second year, to 325·6 among men in their third year, and to 243·4 per 1,000 among men with more than three years in the Command.

There were 10 deaths, or 4·12 per 1,000, among men in their first year, 6, or 4·40 per 1,000, among those in their second year, 5, or 14·53 per 1,000, among men in their third year, and 2, or 2·78 per 1,000, among men who had been more than three years in the Command. The corresponding ratios in the previous year were 6·54, 2·64, 3·31 and 1·64 respectively.

In Abstract II is a table showing the principal statistics of sickness and mortality arranged according to the various sections of disease.

General Diseases.—There were 4 admissions for *small-pox*, all men of the 3rd Battalion Royal Fusiliers; the cases were mild, and all of the men bore satisfactory marks of vaccination. No cause can be definitely assigned to account for these cases, but they were probably contracted from the natives from Spain who pass through the barracks in great numbers daily. There was 1 admission in the previous year, and only 2 are recorded during the preceding ten years. *Other eruptive fevers* were represented by 12 cases, comprising 7 for scarlet fever and 5 for measles, as compared with 11 cases of scarlet fever in the previous year; the causation could not be discovered in any instance.

There were only 5 admissions for *influenza*, as compared with 105 in the previous year.

Enteric Fever caused 21 admissions and 7 deaths. The admission rate was 4·3 per 1,000, which is higher than that for 1899 by 2·2 and than the decennial average rate by ·7. The mortality rate, 1·44 per 1,000, is also higher in both these comparisons by ·38 and ·55 respectively. The percentage of mortality to attack was 33·3, as compared with 50·0 in 1899 and 24·7, the average percentage for the previous ten years. Of the cases, 10 were attributed either to infected Spanish milk, or to ice cream made from it; in the remaining cases no definite cause could be assigned. At the North Front and Casemates 7 cases each occurred, 2 each at Wellington Front and Station Hospital, and one each came from St. Jago's, Buena Vista, and Europa. The admissions occurred in the following months, viz.:—

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
2	—	—	—	—	—	10	2	2	3	—	2	21

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Six of the cases were amongst men under 20 years of age, 10 between 20 and 25 years, 4 between 25 and 30, and 1 was above 30 years of age.

For *other continued fevers* 43 admissions are recorded with 1 death, comprising 33 cases of simple continued and 10 of Mediterranean fever, to which the death was also due. The admission ratio was 8·9 per 1,000, showing no change as compared with that of the previous year, but a decrease in comparison with the decennial average rate of 10·9.

Dysentery gave 2 admissions; in the previous year no case occurred.

There were 5 admissions for *malarial fever*, 4 being for ague and 1 for remittent fever. The admission ratio was 1·0 per 1,000, as compared with 1·9 in the previous year and 7·6, the average rate. All the cases are said to have occurred in troops who had served in tropical climates.

Septic Diseases caused 2 admissions, 1 each for erysipelas and pyæmia, the latter proving fatal. In the previous year there were also 2 admissions but no death.

Tubercular Diseases caused 10 admissions and 2 deaths, the admission ratio, 2·1 per 1,000, being exactly similar to that of the previous year but fractionally higher than the decennial average rate. Nine of the cases and 1 death were due to tubercle of lung.

Venereal Diseases.—Primary syphilis caused 19 admissions, equal to a ratio of 3·9 per 1,000, as compared with 13·1 in the previous year and 20·9, the decennial average rate. If to this be added the sickness from soft chancre, for which there were 265 admissions and 22·64 men constantly sick, the total admission ratio for primary venereal sores was 58·4 per 1,000, which is lower than that of the previous year by 20·2, and than the average for the preceding ten years by 48·0. *Secondary syphilis* with 61 admissions furnished a ratio of 12·6 per 1,000, which is lower than the previous year's rate by 4·8 and than the average rate by 10·4.

Gonorrhœa caused 533 admissions, equal to a ratio per 1,000 of 109·7, showing an increase of 10·5 on that of the previous year, but below the decennial average rate by 20·0. Taking all forms of venereal disease together, the total admission ratio was 180·7 per 1,000, which is less than in 1899 by 14·5 and than the average rate for the preceding ten years by 78·4. The total ratio of constant inefficiency on account of these diseases was 16·05 per 1,000, which is less than the previous year's rate by 3·02 and than the decennial average rate by 8·00.*

Parasitic Diseases.—There were 70 admissions, comprising 51 of scabies, 15 of phthirius inguinalis, 2 of tænia solium, and 2 of ringworm. The admission ratio was 14·4 per 1,000 and is above the previous year's and the decennial average rates by 2·3 and 1·2 respectively.

For *alcoholism* there were 36 admissions, of which 5 are returned as delirium tremens. The ratio, 7·4, shows a decline of 1·7 in comparison with the rate for 1899, but is above the decennial average rate by 1·2 per 1,000. A death occurred from alcoholism accelerated by injuries to the head, caused by a fall.

For *rheumatism* there were 76 admissions recorded, including 1 case each for rheumatic fever, gout, and osteo-arthritis, giving a ratio of 15·7 per 1,000, which is below the previous year's rate by 3·4, and that of the decennial average by 10·4.

Debility gave 38 admissions, equal to a rate of 7·8 per 1,000, which exceeds the previous year's rate and that of the decennial average by 2·3 and 3·0 respectively.

Under the heading of *other general diseases* 20 admissions are returned, comprising 10 for cyst, 9 for non-malignant new growth and 1 for anæmia. The ratio, 4·1 per 1,000, is lower by 3·1 and 3·0 than the previous year's rate and the decennial average rate respectively.

Local Diseases.—For *Diseases of the Nervous System* there were 31 admissions, including 6 for mental affections, the equivalent ratio being 6·4 per 1,000, which is practically the same as in the previous year, but lower than the average rate by 4·1. The cases included 9 of neuralgia, 5 of

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* There were no admissions for ulcer of penis of non-venereal origin.

epilepsy, 4 each of hysteria and melancholia, 3 of paralysis and 2 each of meningitis, headache, and mania. There were 2 deaths, one from meningitis and one from melancholia.

Diseases of the Eye caused 44 admissions, or a ratio of 9·1 per 1,000, which is higher than the rate for 1899 by 1·7, but lower than the average rate by ·6. Conjunctivitis contributed 26 of the cases and ametropia 13.

Diseases of other Organs of Special Sense, with 24 admissions, gave a ratio of 4·9 per 1,000, which is higher than the rate given in the previous year by 1·3 but lower than the decennial average rate by 4·7. The admissions included 18 for inflammation of the external meatus, 2 each for epistaxis and diseases of the membrana tympani, and 1 each for tinnitus and necrosis of the nose.

Diseases of the Circulatory System.—Under this head there were 37 admissions recorded, the equivalent ratio being 7·6 per 1,000, which is higher than that for the previous year and the decennial average rate by 2·3 and 2·5 respectively. The admissions comprised 22 cases of disordered action and 7 of valvular disease of the heart, 4 of varix, 3 of syncope and 1 of dilatation of the heart.

Diseases of the Respiratory System furnished 124 admissions, the ratio being 25·5 per 1,000, which is above the previous year's rate by 2·2, but below that of the decennial average by ·8. Bronchial affections furnished 93 of the cases, and there were 14 cases of pneumonia, 6 of pleurisy, 3 of asthma and 3 of phthisis. There were 2 deaths, one each from pneumonia and empyema.

Diseases of the Digestive System.—There were 380 admissions recorded, giving a ratio of 78·2 per 1,000, which is lower than the rate for 1899 and that of the decennial average by 13·7 and 15·2 respectively. Among the cases treated were 193 affections of the mouth and throat, 97 of colic, 25 of diarrhœa, 23 of dyspepsia, 14 of hernia, 13 of piles and 10 of hepatic affections. There were 2 deaths, one due to hernia (strangulated), and one to obstruction of the intestines.

Diseases of the Lymphatic System caused 48 admissions, or a ratio of 9·9 per 1,000, being above the previous year's rate by ·6, but below the decennial average rate by 6·6. Of the cases, 42 are returned as inflammation of glands, 4 as suppuration of glands, and 2 as goitre.

Diseases of the Urinary System gave 10 admissions, or a ratio of 2·1 per 1,000, which is fractionally below the previous year's ratio and that of the decennial average. The admissions were 5 for incontinence of urine, 2 for acute nephritis and 1 each for Bright's disease, cystitis and retention of urine.

Diseases of the Generative System caused 298 admissions, or a ratio of 61·3 per 1,000, which is below the ratio for 1899 and the decennial average rate by 14·1 and 38·4 respectively. In addition to the 265 cases of soft chancre referred to under the heading of venereal diseases, the admissions included 17 for orchitis, 7 for stricture of the urethra, 4 for balanitis, 2 for varicocele, and 1 each for phimosis, paraphimosis and hydrocele.

Diseases of the Organs of Locomotion, with 43 admissions, gave a ratio of 8·9 per 1,000, which is lower than the previous year's and the average rates by ·9 and ·7 respectively. The chief cause of admission was synovitis.

Diseases of the Connective Tissue.—There were 123 admissions, equal to a ratio of 25·3 per 1,000, which shows a decrease in comparison with the previous year's ratio of 3·7, but is precisely similar to the decennial ratio. 66 of the cases were due to inflammation and 56 to abscess of the connective tissue, and 1 case to undue formation of fat.

Diseases of the Skin were the cause of 139 admissions, the equivalent ratio being 28·6 per 1,000, which is lower than that for 1899 by 19·9 and than that of the decennial average by 13·5. Eczema, boils, ulcers, whitlow and onychia were the chief causes of admission.

INJURIES.—The total admission rate was 57·8 per 1,000, as compared with 82·6 the ratio for the previous year, and 103·2 the decennial average rate. For *general injuries* there were 7 admissions, 4 being for heat-stroke, 2 for exhaustion due to over-exertion whilst swimming, and 1 of multiple injury. There were 274 admissions for *local injuries*, mostly for wounds,

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sprains, contusions, fractures and abrasions. There were also 2 cases of gunshot wound, one suicidal, and one accidental. Of the 5 deaths recorded, 3 were due to fracture of skull, one of which occurred in a man who jumped from a window while in a state of somnambulism, and two in men who accidentally fell down the rocks. The remaining two deaths were suicidal, one the case of suicide referred to above and the other a case of wound of neck self-inflicted during temporary insanity. No motive could be assigned in either case.

SURGICAL OPERATIONS.—The following is a statement of the principal surgical operations performed during the year, according to the classification of the nomenclature of diseases:—Operations on lymphatic organs (2), on joints (1), amputations (2), operations on skull and brain (1), on face and mouth (1), on eye (1), on thorax and breast (1), on the abdomen (2), and operations on the generative organs (1). The operations on the lymphatic organs were both removal of glands on account of bubo due to soft chancre; in the operation on joints, the knee was opened and a drainage tube inserted; the amputations were both of fingers; the operation on the skull was on account of fracture, two pieces of the left temporal bone being removed; the operation on the eye was one of excision of eyeball; the operation on the thorax and breast was that of aspiration of the pleural cavity; the operations on the abdomen were herniotomy and Mannsel's operation for enterectomy; and the operation on the generative organs was for epithelioma of scrotum. Chloroform was the anæsthetic used in every instance. Death resulted in three cases, viz., after aspiration for pleurisy empyema supervening, and after the operations of herniotomy and enterectomy.

INVALIDING.—The number of invalids sent home during the year was 102, equal to a ratio of 21·00 per 1,000, which is higher than the previous year's rate by 7·66, and than the average rate for the preceding ten years by 6·59.

Among individual corps, excluding those only a short time in the Command, the highest rate of invaliding, as in the previous year, was in No. 20 Company, Eastern Division, Royal Garrison Artillery, with 35·18 per 1,000, the next highest being in No. 26 Company, Southern Division, with 34·93; No. 11 Company, Eastern Division, which gave the second highest rate in 1899, also furnished a high rate (33·58 per 1,000). In the Royal Engineers the rate was 32·26 per 1,000, and in the Infantry the 3rd Battalion Royal Fusiliers gave 23·45, and the 1st Battalion Royal Berkshire Regiment 20·34 per 1,000.

As to the ages of the men invalided, 5, or 5·34 per 1,000, were under 20 years, 41, or 19·48 per 1,000, were between 20 and 25, 36, or 31·11 per 1,000, were between 25 and 30, 16, or 31·43 per 1,000, were between 30 and 35, and 4, or 26·67 per 1,000, were over 35 years of age. In the previous year the corresponding rates were 8·57, 12·86, 13·96, 31·55 and 7·46 respectively. With regard to invaliding according to service in the Command, 54 men, or 22·22 per 1,000, were in their first year, 27, or 19·78 per 1,000, were in their second, 8, or 23·26, were in their third year, and 13, or 18·08, had been more than three years in the Command. The corresponding rates in the previous year were 12·07, 14·49, 8·28, and 19·64 respectively. The principal causes of invaliding were circulatory disorders 14 cases, including 8 for valvular disease, and 5 for disordered action of the heart, giving a ratio of 2·88 per 1,000, nervous diseases 14 cases, with a similar ratio, including 6 cases, or 1·23 per 1,000, of mental disorders, diseases of the eye 10 cases, or 2·06 per 1,000, debility 12, or 2·47 per 1,000, rheumatism, diseases of the respiratory system, and of the organs of locomotion 8 cases each, or 1·65 per 1,000, secondary syphilis 7 cases, or 1·44 per 1,000, and tubercular diseases 6 cases (all tubercle of lung), or 1·23 per 1,000.

The number of men discharged the service as medically unfit was 59, equal to a ratio of 12·15 per 1,000, which is higher than the ratio given in the previous year and than the average rate for the preceding ten years by 4·53 and 2·71 respectively. The chief causes of discharge were diseases of the nervous system 14 cases, or 2·88 per 1,000 (including 8 cases, or 1·65 per 1,000, of mental affection), diseases of the eye 7 cases, or 1·44 per 1,000,

diseases of the circulatory system 7 cases, with a similar ratio (3 for valvular disease and 4 for disordered action of the heart), tubercle of lung 6 cases, or 1·23 per 1,000, diseases of locomotion 4 cases, or ·82 per 1,000, and secondary syphilis, debility, diseases of the respiratory and urinary systems each 3 cases, or ·62 per 1,000. *Gibraltar.*

OFFICERS.—The average strength was 146, and there were 48 cases of sickness, the ratio being 328·8 per 1,000, or below the ratio for 1899 by 71·2. No death occurred, but 5 officers were invalided, on account of Mediterranean fever, rheumatism, pneumonia, hepatitis and sprain. Among the cases treated were 9 of influenza, 2 each of other continued fevers, ague, and rheumatism, 10 of digestive disorders and 12 of injury. A case of small-pox occurred in an officer, who, prior to the attack, had been on leave at Algeçiras, where the disease was prevalent. The case was a very mild one.

WOMEN.—There was an average strength of 321, with 78 admissions and 1 death, equal to ratios of 243·0 and 3·11 per 1,000 respectively, which in comparison with the previous year's rates show decrease to the extent of 264·8 in the former and 6·23 in the latter. The chief causes of sickness were anæmia 14 cases, influenza 8, dyspepsia 7, debility 5, rheumatism 4, and there were 11 cases of disease peculiar to women. The death was due to dilatation of the heart.

CHILDREN.—The average strength was 571, and there were 227 cases of sickness and 30 deaths. The admission rate was 397·5 and that of mortality 52·53 per 1,000, the former being lower by 507·3 and the latter higher by 22·05 than the corresponding rates in 1899. Among the cases treated were 67 of influenza, 24 each of whooping-cough, diarrhœa, and bronchial affections, 13 of chicken-pox, 11 of measles, 8 of disorders of dentition, and 7 of inflammation of the intestines. There was also 1 case each of scarlet fever and diphtheria. The deaths were 8 from diarrhœa, 6 from inflammation of intestines, 4 each from immaturity at birth and bronchitis, 2 each from influenza, infantile convulsions and broncho-pneumonia, and 1 each from measles and disorders of dentition.

VACCINATION.—All the vaccinations during the year were carried out with lymph from the Army Vaccine Institute, Aldershot. Of 129 primary vaccinations amongst the children 61 were failures, and of 22 cases of re-vaccination 5 were failures. There were 35 re-vaccinations amongst the men, and 4 amongst the women, failure resulting in 22 instances in the former and 1 in the latter. In his remarks the Principal Medical Officer notes that:—"Since the lymph has been supplied weekly, the vaccination has been much more successful."

SANITARY CONDITIONS.

The acting Principal Medical Officer (Lieut.-Colonel W. S. Pratt, M.B., Royal Army Medical Corps) reports that the health of the troops has been very good during the year, and calls attention to certain altered conditions obtaining in the garrison and its surroundings, which in his opinion tend to show that the danger of enteric and allied diseases arising from without the fortress is materially increased, and that the danger from within has considerably diminished. As regards the first, the large Admiralty Harbour and Dockyard Works have resulted in an army of workmen, mostly Spaniards, entering and leaving the Rock daily, an average of 15,000 coming from Linea daily, and some hundreds from Algeçiras by boat. The town of Linea, within a few hundred yards of the North Front hutments, contains over 40,000 inhabitants, and on account of the total absence of sanitation is said to be a nucleus of enteric, diphtheria, small-pox, and kindred diseases. The proximity of this town must always be a source of

Gibraltar.

danger, and of almost more importance is the fact that enormous quantities of fruit and vegetables which come through it are frequently stored in insanitary places, and washed with water of most doubtful quality. At the south end of the Rock, near the lighthouse, the whole untreated drainage passes into the sea through the new main drain, and although this is a great sanitary boon, it possesses one source of danger to the buildings in the immediate neighbourhood, viz., that in stormy weather these buildings are drenched with spray, which at times must carry sewage matter with it. As regards the second, the altered conditions noted are the completion of the large tank reservoirs, enormously increasing the supply of fresh water; the completion and satisfactory working of the new main drainage scheme; and the vigorous house-to-house inspection and prompt isolation and removal of infectious cases by the Civil Sanitary Commissioners.

At the North Front cattle sheds the wells were found to be contaminated, and there were some cases of typhoid at North Front which might possibly be attributed to the improper use of this water; there was also an outbreak of sickness amongst the cattle. A full investigation was held, and recommendations were submitted for an improvement in the general sanitary condition of these sheds, which recommendations were about to be carried out.

In connection with the sanitary reports of districts, the following are the principal points noted:—

In No. 1 District, North Front and Catalan Bay, a new sanitary system at the Army Service Corps bakery was instituted; the drainage at the Principal Medical Officer's quarters was renewed and improvements made in the outlying guard-rooms in concreting beneath the floors and in the urinals. Special arrangements were made to prevent men employed on the rifle ranges from consuming eatables and drinkables imported from Spain, which are always open to suspicion, and to supply them with pure drinking water. Public latrines were also provided at Catalan Bay.

In No. 2 District the entire reconstruction of the drainage has been completed and works well. The large rain-water tank under the schools, noted in last year's report as unsatisfactory, was condemned as a water storage tank for cooking and drinking purposes. The supply of jalousies to the married quarters, also referred to in the report for 1899, has not yet been carried out, but will shortly be proceeded with.

In No. 3 District no improvements or defects are specially noted in the sanitary condition.

In No. 4 District the gradual replacement of the old pattern latrines by more modern ones is recommended. At present dry-earth closets are used.

In No. 5 District improvements have been effected by the reconstruction of the drainage in officers' quarters in College Lane, the officers' mess, Line Wall, and the Garrison recreation rooms.

In No. 6 District it is stated that the latrines are of an old pattern and are being replaced by more modern ones. The rain-water tanks have been cleaned and the water is examined periodically.

In No. 7 District a new cook-house is in course of erection. Ablution and bath rooms were rebuilt at Rosia Barracks.

In No. 8 District a new recreation room has been opened, and three extra baths have been provided at Buena Vista Barracks. The drains have been renewed and the latrines in the vicinity of the guard-room re-erected.

In No. 9 District the Brewery Barracks and married quarters have been condemned as unfit for occupation, owing to their proximity to the ventilating shaft and sewage outfall works, from which disagreeable smells emanate, and also from their position being too near the sea. A new block of quarters for the men has nearly been completed and will shortly be occupied.

At Europa the whole of the drainage, from Europa guard-room to the sea, has been relaid, and a large verandah has been added to the canteen.

A new gymnasium is being built for the garrison, and one block of the new hospital is approaching completion.

IV.—ON THE HEALTH OF THE TROOPS SERVING IN THE MALTA COMMAND.

Sickness and Mortality.

I.—British Troops.

The average strength of the troops serving in the Malta Command (excluding the Royal Malta Artillery) was 8,732, including the force detached for service in Crete, the average annual strength of which was 592.

The units serving throughout the whole year were No. 17 Company, Eastern Division, Nos. 1, 17, 19, 27 and 31 Companies, Southern Division, and 24 Company, Western Division, Royal Garrison Artillery, 2 Companies of the Royal Engineers, the 1st and 3rd Battalions Lancashire Fusiliers, the 2nd Battalions of the Derbyshire and Loyal North Lancashire Regiments, and the 3rd Battalion Royal Warwickshire Regiment, with detachments of the Army Service, Royal Army Medical, Army Ordnance, and Army Pay Corps, and Garrison Staff.

Taking the Command as a whole, the arrivals were Nos. 4 and 13 Companies, Southern Division, Royal Garrison Artillery, in January, No. 51 Company, Royal Engineers, in April, the 5th Battalion Northumberland Fusiliers, in February, and the 3rd Battalions Loyal North Lancashire and Royal West Kent Regiments, in January, all from the United Kingdom.

The troops leaving the Command were No. 5 Company, Eastern Division, Royal Garrison Artillery, in January, the 1st Battalion Royal Sussex Regiment, in February, and detachments of the Army Service, Royal Army Medical, and Army Ordnance Corps, at various times during the year, to South Africa.

In the following table are shown the admission, mortality, invaliding rates, &c., among the troops in the whole Command, and also separate statistics for those serving in Crete :—

1900.	Average Strength.	Admissions.	Deaths.			Invalids.	
			In the Command.	Of Invalids.	Total.	Sent Home.	Finally discharged.
Malta and Gozo	8,140	7,430	47	1	54	229	68
Crete	592	622	6				
Total ..	8,732	8,052	53	1	54	229	68

lta. (*continued*)

1900.	Average constantly Sick.	Ratio per 1,000 of Strength.				
		Admissions.	Deaths.	Invalids sent Home.	Invalids finally discharged.	Constantly Sick.
Malta and Gozo.. ..	395·48	912·8	6·18	26·22	7·79	48·58
Crete	32·19	1050·7				54·38
Total ..	427·67	922·1	6·18	26·22	7·79	48·98

Comparing the statistics of the whole Command with those of the previous year, the admission rate has increased by 62·7 per 1,000, and was also greater than the average of the preceding ten years by 141·1 per 1,000, while the death rate is lower by 2·42 and 2·79 per 1,000 respectively in the two comparisons. The constantly sick rate was lower than in 1899 by ·10, but higher than the decennial average rate by ·15.

The average sick time to each soldier, 17·88 days, was fractionally shorter (·03 of a day) than in the previous year, but fractionally longer (·06 of a day) than the decennial average period. The average duration of each case of sickness was 19·39 days, which is less than in 1899 and than the decennial average rate by 1·45 and 3·43 days respectively.

If the figures relating to Crete, as given in the foregoing table, are excluded, the admission rate for Malta and Gozo is higher than in 1899 by 65·8, and the constantly sick ratio is lower by 2·11 per 1,000. Taking Crete alone the admission and constantly sick ratios show an increase, as compared with the previous year, of 113·2 and 15·37 per 1,000 respectively.

In Abstract No. XXIX is a table showing the health statistics for the several regiments and corps which served in the Command during the year. In the artillery, the admission, mortality and constantly sick rates were 608·5, 4·56 and 36·82 per 1,000 as compared with 508·4, 7·56, and 33·17 in 1899. The highest admission rate was 959·3 per 1,000 in No. 13 Company, Southern Division, at Ricasoli, the next highest being 935·0 per 1,000 in No. 4 Company, Southern Division, quartered at Tigné ; both these companies arrived from the United Kingdom in January. The lowest rate was 370·0 per 1,000 in No. 24 Company, Western Division, at Ricasoli, the next lowest being 450·2 per 1,000 in No. 19 Company, Southern Division, quartered during the first five months of the year at Ricasoli, and afterwards at Upper St. Elmo. The constantly sick rate was highest, 70·41 per 1,000, in No. 13 Company, Southern Division, the next highest being 49·37 per 1,000 in No. 17 Company, Southern Division. The lowest rates were 24·42 per 1,000 in No. 1 Company, Southern Division, and 26·03 per 1,000 in No. 24 Company, Western Division. In the infantry the admission rate was 1008·1, the death rate 7·31, and the constantly sick rate 55·64 per 1,000, as compared with 995·3, 8·25, and 55·96 per 1,000 in 1899. Among battalions with an annual average strength of over 100 men, the highest admission rate was 1272·0 per 1,000 in the 3rd Battalion Lancashire Fusiliers, stationed at Lower St. Elmo, the next highest being 1085·5 per 1,000 in the 1st Battalion Lancashire Fusiliers, quartered in Crete. The lowest ratio was 465·5 per 1,000 in the 1st Battalion Royal Sussex Regiment stationed at Verdala, the next lowest being 701·2 per 1,000 in the 2nd Battalion Derbyshire Regiment quartered mainly at Imtarfa. The highest death rate was 13·95 per 1,000 in the 3rd Battalion Lancashire Fusiliers, the next highest being 8·62 per 1,000 in the 1st Battalion Royal Sussex Regiment. The lowest rate was 2·62 per 1,000 in the 2nd Battalion Loyal North Lancashire Regiment, the

next lowest being 6·00 in the 3rd Battalion Warwickshire Regiment. The highest rates of constant inefficiency were 77·26 and 61·98 per 1,000 in the 3rd and 1st Battalions of the Lancashire Fusiliers respectively, the two lowest ratios being 35·52 per 1,000 in the 1st Battalion Royal Sussex Regiment and 40·24 per 1,000 in the 2nd Battalion Derbyshire Regiment. In the Infantry Militia Regiments which served in the Command the admission, death, and constantly sick ratios were 1146·7, 5·59, and 53·50 respectively, the 3rd Battalion Loyal North Lancashire Regiment with 1207·7 furnishing the highest admission ratio, while the highest death and constantly sick rates were furnished by the 5th Battalion Northumberland Fusiliers with 6·55 and 57·82 per 1,000 respectively. *Malta.*

With reference to the influence of age on the sickness and mortality it is observed that the admission rate was 1087·5 per 1,000 among men under 20 years of age, 1134·8 among men between 20 and 25 years of age, 546·9 among men between 25 and 30 years, and 770·6 among men of 30 years of age and upwards. In the previous year the highest rate was among men between 20 and 25 years, and the lowest among men of 30 years of age and upwards. The death rates at the various age periods named were 4·44, 6·61, 4·49, and 9·24 per 1,000 respectively; in the preceding year the highest death rate was among men over 30 years of age, and the lowest among those under 20 years.

With regard to service in the Command, the admission rate was 1105·7 per 1,000 among men in their first year, the next highest, 856·6 per 1,000, being among men in their third year, followed by 707·5 per 1,000 among men in their second year, 367·7 per 1,000 among men who had more than four years' service, and 358·5 per 1,000 among men in their fourth year of service. In the previous year the highest and lowest ratios were among men in their first year and those who had been more than four years in the Command. The ratio of mortality was highest, 8·96 per 1,000, among men in their third year, followed by 8·92 per 1,000 among men in their second year, 7·55 per 1,000 among men in their fourth year, 4·28 per 1,000 among men in their first year, and 3·23 among men who had been more than four years in the Command. In the previous year, as in the year under report, the highest death rate was among men in their third year, but the lowest was among men in their first year.

In Abstract III will be found the statistics of sickness, mortality, &c., arranged according to the different sections of disease.

General Diseases.—One case of *small-pox* occurred in a man of the 3rd Battalion Loyal North Lancashire Regiment; the infection is stated to have been probably "aerial borne," as the man was quartered at Manoel, and cases of small-pox were under treatment in the adjacent lazaretto. The case was a mild one, and the patient bore good marks of vaccination. *Other eruptive fevers* were represented by 3 admissions for scarlet fever. *Influenza* caused 2 admissions as compared with *nil* in the previous year.

Enteric Fever.—There were 31 admissions and 11 deaths, all of which occurred in Malta. The admission rate for the Command, 3·6 per 1,000, is lower than in 1899 and than the decennial average rate by 1·7 and 5·1 respectively, and the death ratio, 1·26 per 1,000, is also lower in both these comparisons by ·95 and 1·78 respectively.

Taking Malta and Gozo alone, and omitting the strength of the garrison in Crete, the admission rate was 3·8 per 1,000, as compared with 5·5 in the previous year and with 6·9, the decennial average rate, while the death rate was 1·35 per 1,000, as against 2·29 and 2·52 in the two comparisons. In the previous year Crete furnished admission and mortality ratios of 4·2 and 1·69 per 1,000 respectively.

The percentage of mortality to attack was 35·5, as compared with 41·3 in the previous year and with 34·8, the average percentage for the preceding ten years. Of the men attacked 6 were under 20 years of age, 6 were in their 21st year, 3 in their 23rd year, 3 in their 24th year, and 13 were 24 years of age and upwards. As to total service, 6 were in their second year, 10 in their third, 3 in their fifth, and 12 had over five years' service; 17 had been less than one year in the Command, 4 were in their second year, 8 in their third year, and 2 had served more than three years in the Command.

Malta. During the first quarter of the year 4 cases occurred, during the second *nil* during the third 11, and 16 cases occurred during the fourth quarter of th year.

Of the 31 cases which occurred 5 were admitted from Floriana, 4 from Manoel, 3 each from Imtarfa and Ricasoli, the remainder being admitted from various military districts. The enquiries instituted in each instance failed to trace the cause. The cases are stated to have been generally of a severe type.

Other continued fevers caused 1,364 admissions and 8 deaths. The admission rate was 156·2, and the mortality rate ·92 per 1,000, being lower than in 1899 by 17·0 and ·13, and than the average for the preceding ten years by 9·2 and 31 per 1,000 respectively. Mediterranean fever accounted for 159 of the cases and all the deaths, the remaining 1,205 admissions being shown as simple continued fever. The admission and death ratios for the former disease were 18·2 and ·92 per 1,000, as compared with 32·1 and 1·05 per 1,000 in 1899. 47 of the cases of simple continued fever and 1 of those of Mediterranean fever occurred in Crete, and, as was the case in 1898 and 1899, there was no death in the island from either cause. In his remarks on the subject the Principal Medical Officer states that "during the summer months a good deal of Mediterranean fever prevails, both in the civil and military population, and causes which lead to its contraction have not yet been discovered. The etiology of this disease is obscure. As a rule it cannot with any degree of accuracy be distinguished from enteric during the first three or four weeks of its course."

Dysentery caused 31 admissions, or a ratio of 3·6 per 1,000, which is practically the same as in the previous year, but is lower than the average for the ten years 1890–99 by 3·0. There were no deaths.

Malarial Fevers were the cause of 209 admissions and 1 death. Of the admissions 204 were returned as ague and 5 as remittent fever, 129 of the former and 4 of the latter occurring at Crete. The fatal case, in which there were cerebral and other complications, occurred at Crete. The admission ratio, 23·9 per 1,000, is lower than in the previous year and than the average rate by 59·5 and 14·9 per 1,000 respectively. The large decrease as compared with 1899 is accounted for by the fact that the disease was much less prevalent at Crete. The medical officer at Cottonera Hospital, remarking on malarial fevers, states :—"Cases admitted have been contracted elsewhere, and the tendency is quickly eradicated in Malta. A residence here (Malta), except in *sirocco* months, is preferable to going home for this class of disease."

Septic Diseases.—There were 3 admissions under this heading, 2 for erysipelas and 1 (a fatal case) for septicæmia.

Tubercular Diseases caused 35 admissions and 5 deaths, the admission ratio, 4·0 per 1,000, being higher than in the previous year and than the average for the preceding ten years by 1·8 and 1·5 respectively, while the mortality ratio, ·57 per 1,000, was lower in both these comparisons by ·36 and ·33 respectively. Tubercular disease of the lungs caused 34 of the admissions and all the deaths.

Venereal Diseases.—There were 52 admissions for *primary syphilis*, or a ratio of 6·0 per 1,000, which is below the previous year's rate by 5·5 and the average rate by 18·4. If to this be added the sickness from soft chancre, for which there were 254 admissions and 19·05 men constantly sick, the total admission ratio for primary venereal sores equalled 35·1 per 1,000, as compared with 47·0 in 1899 and with 48·5, the decennial average ratio. The constantly sick rate was 2·71 per 1,000, as against 3·80 and 4·42 in the two comparisons. *Secondary syphilis* caused 113 admissions, equal to a ratio of 12·9 per 1,000, which is lower than that for the previous year by 2·4 and than the average rate by 4·4. The constantly sick rate, 1·44 per 1,000, was higher than in 1899 by ·05, but lower than the decennial average rate by ·48. *Gonorrhœa*, with 609 admissions, gave a ratio of 69·7 per 1,000, which is lower than in 1899 by 15·6, and than the average rate by 14·0. The constantly sick rate was 5·14 per 1,000, which is lower than that for the previous year by 1·85, and than the average rate by 1·27.

Taking all forms together, the total admission ratio for venereal disease was 117·7 per 1,000, which is lower than that for the previous year by 29·9,

and than the average rate for the ten years 1890–99 by 31·8, while the constantly sick rate, 9·29 per 1,000, is lower than in 1899 by 2·89, and than the average rate by 3·46.* *Malta.*

In Crete there were 56 admissions for gonorrhœa, 23 for soft chancre, and 4 for secondary syphilis. No case of primary syphilis was recorded during the year. The total admission rate for all forms of venereal disease was 140·3 per 1,000, and there were 7·42 men constantly sick from these affections, the ratio being 12·53 per 1,000.

The Senior Medical Officer remarks on the absence of syphilis among the troops as "a testimony that the control exercised over the prostitutes in the town by the civil power has been of benefit to the garrison." Referring to the admissions for gonorrhœa and soft chancre, he states that "less care, however, has been exercised over the women suffering from gonorrhœa, which accounts in part for the larger number of admissions for this complaint." The medical officer in charge at Kandia, in a report on the subject of venereal disease, remarks that the task of checking as far as possible the spread of this disease among the British troops in Crete has become more difficult during 1900, as in July of the previous year the government of the town of Kandia was taken over by the civil (Cretan) authorities and the administration of the laws affecting prostitution became vested in them. There was reason to believe that unregistered Moslem prostitutes have increased in numbers, and a request was made that they should be placed under the same control as the Christian women. The Christian authorities of the town are not anxious, however, to do anything that might offend the susceptibilities of the Moslem inhabitants, so that hitherto the matter has been in abeyance.

For *parasitic diseases* there were 125 admissions, the ratio, 14·3 per 1,000, being higher than in 1899 by 4·3, and than the decennial average rate by 2·3. Among the admissions were 72 cases of scabies, 17 of phthirius inguinalis, 15 of tænia solium, and 12 of ringworm.

Alcoholism caused 34 admissions and 1 death, or a ratio of 3·9 per 1,000, as compared with 2·4 in the previous year and 2·5 the average rate. Four of the admissions were recorded as delirium tremens.

Under *rheumatism* 261 admissions, including 14 for rheumatic fever, are recorded, the ratio, 29·9 per 1,000, showing an increase as compared with the previous year of 16·8, and of 7·4 in comparison with the decennial average ratio. One death occurred from rheumatic fever.

Debility caused 85 admissions, equal to a ratio of 9·7 per 1,000, as compared with 7·6 in the previous year, and 8·9 the decennial average rate. In Crete there were only 2 admissions, or a ratio of 3·4 per 1,000, as compared with 5·9 in 1899, and 57·6 in 1898.

Under the heading of *other general diseases* are included 28 cases of non-malignant new growth, 21 of anæmia, 7 of cyst, 3 of choleraic diarrhœa, and 1 of purpura.

Local Diseases.—*Diseases of the Nervous System* were the cause of 126 admissions, the equivalent ratio being 14·4 per 1,000, which is higher than that in the previous year by 8·5 and than the decennial average ratio by 6·7. Among the cases were 22, or 2·5 per 1,000, of mental affection, the remainder including 67 cases of neuralgia, 8 of headache and 6 of epilepsy. The cases of mental affection comprised 7 of mania, 4 each of idiocy, melancholia and dementia, 2 of mental stupor and 1 of delusional insanity. Three deaths occurred, 2 being due to meningitis and 1 to inflammation of the brain.

Diseases of the Eye caused 144 admissions, or a ratio of 16·5 per 1,000, which is higher than in the previous year by 6·7 and than the average for the ten years 1890–99 by 6·3. The cases included 89 of conjunctivitis, 14 of ametropia, 11 of blepharitis marginalis, and 9 each of iritis and stye.

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* There were 12 admissions for ulcer of penis of non-venereal origin, with ·62 men constantly sick. If, as in former years (prior to 1897), these cases were included with those of primary syphilis and soft chancre under the heading of primary venereal sores, the admission and constantly sick rates for all venereal diseases would equal 119·1 and 9·36 respectively.

Malta.

Diseases of other Organs of Special Sense gave a ratio of 13·9 per 1,000, which is lower than in the previous year by 2·2, but higher than the decennial average rate by 2·0. Of the 121 admissions, 90 were due to inflammation of, and 5 to accummulation of wax or epidermis in, the external meatus, 18 to inflammation of the middle ear, 6 to perforation of the membrana tympani, and 2 to deafness.

Diseases of the Circulatory System.—There were 102 admissions under this heading, equal to a ratio of 11·7 per 1,000, which is higher than in 1899 and than the average rate for the preceding ten years by 4·6 and 5·6 respectively. Among the cases were 67 of disordered action and 15 of valvular disease of the heart, and 11 of varix. Four deaths occurred in the Command, one each from valvular disease of the heart, fatty degeneration of the heart, saccular aneurysm and cirsoid aneurysm, and an invalid died from valvular disease of the heart.

Diseases of the Respiratory System were the cause of 317 admissions, equal to a ratio of 36·3 per 1,000, as compared with 19·4 in 1899 and with 20·4, the decennial average rate. There was one death due to pneumonia, the ratio, ·11 per 1,000, being lower by ·70 and ·42 respectively in the two comparisons. Bronchitic affections caused 261 of the admissions, and among the remainder were 17 for pneumonia, 13 for pleurisy, 8 for spasmodic asthma and 7 for laryngitis.

Diseases of the Digestive System caused 1,501 admissions and 3 deaths, equal to ratios of 171·9 and ·34 per 1,000, the former being higher than in 1899 by 66·4 and than the average rate by 84·0, while the latter is lower in both comparisons, by ·12 and ·24 respectively. The principal causes of admission were diseases of the mouth and throat 522 cases, hepatic affections 293 (including 243 of jaundice and 41 of congestion of liver), diarrhœa 257, dyspepsia 168, colic 145, piles 41, and 22 cases of hernia. 75 of the admissions for digestive disorders occurred in Crete and included 40 for mouth and throat affections, 12 for dyspepsia, and 7 for jaundice. The deaths were due to hepatitis, abscess of liver, and peritonitis.

The Principal Medical Officer states that "the medical officers attribute the increase in the number of admissions under this system as due, in some measure, to intemperance and defective teeth."

Diseases of the Lymphatic System were the cause of 47 admissions, equivalent to a ratio of 5·4 per 1,000, as compared with 6·3 in the previous year, and with 8·8 the average ratio for the ten years 1890–99. Of the admissions, 44 were due to inflammation or suppuration of the lymphatic glands, 2 to elephantiasis and 1 to congestion of the spleen.

For *diseases of the urinary system* there were 12 admissions, or a ratio of 1·4 per 1,000, which is higher than in the previous year by ·1, but lower than the average rate by ·3. The causes of admission were cystitis and incontinence of urine 4 cases each, acute nephritis 2, and 1 case each of Bright's disease and hæmaturia.

Diseases of the Generative System were represented by 436 admissions, or a ratio of 49·9 per 1,000, which is lower than in 1899 by 2·8, but is higher than the average for the ten years 1890–99 by 9·6. In addition to the 254 cases of soft chancre already referred to under the heading of venereal diseases, the admissions included 69 for balanitis, 53 for orchitis, 15 for stricture of urethra, 12 for ulcer of penis, 6 each for paraphimosis and varicocele, and 5 each for hydrocele and epididymitis.

Diseases of the Organs of Locomotion gave a ratio of 12·5 per 1,000, which is higher than in the previous year and than the average rate by 1·9 and 5·4 respectively. Synovitis 53 cases, and myalgia 30 cases, furnished the majority of the admissions.

For *diseases of the connective tissue* there were 373 admissions, or a ratio of 42·7 per 1,000, as compared with 38·2 in 1899, and with 31·0 the average rate. 193 of the admissions were due to abscess and 180 to inflammation of the connective tissue.

Diseases of the Skin caused 679 admissions, the equivalent ratio being 77·8 per 1,000, which is higher than in the previous year by 16·3 and than the decennial average rate by 30·4. The chief causes of admission were eczema 241 cases, boils 180, ulcers 117, whitlow 29, onychia 23, psoriasis and herpes 15 cases each, urticaria 14 and impetigo 12 cases.

INJURIES.—The total admission rate was 108·1 per 1,000, as compared with 95·7 in the previous year and with 90·6, the decennial average rate.

For *general injuries* there were 9 admissions, viz. :—7 for multiple injury, and 1 each for burns and scalds and shock. Eleven deaths are recorded, viz. :—6 from suffocation from submersion, the coroner's verdict in five cases being "accidental drowning," and in the sixth case "found drowned"; 3 from multiple injury, one being the result of attempted suicide, one from compression of chest, the case being that of a submarine miner who got out of his depth when trying to recover a lost torpedo; and one from shock, the coroner's jury returning a verdict in this case of "found dead in St. Paul's ditch."

There were 935 admissions for *local injuries*, mostly due to wounds, sprains, contusions, and abrasions. There were 3 deaths from local injuries, all suicidal cases of gunshot wound, but in no case was any motive recorded.

POISONS.—One admission only occurred, from partaking of decayed and poisonous food. The case ended in recovery.

SURGICAL OPERATIONS.—The more important surgical operations comprised evacuation of abscesses (1); operation on veins for cure of varix (1); trephining, consequent on meningitis and fracture of vault of skull respectively (2); operation on the eye and its appendages (2), viz., for iridectomy and division of internal rectus; incision into joint in a case of suppurative arthritis (1); operation for suture of tendons of hand in a case of wound of palm of hand with division of flexor tendons of little finger (1); operations for abscess of liver (1); operations on the rectum and anus, including fistula in ano, and relief of abscess in ischio-rectal fossa (2); and incision of perineum for introduction of catheter into bladder consequent on rupture of the urethra, with extensive extravasation of blood into scrotum and perineum (1).

Chloroform was the anæsthetic used in 11 cases, and cocaine in 1.

Recovery resulted in all except 2, namely, 1 after the operation of trephining consequent on meningitis, and 1 from abscess of liver.

INVALIDING.—The number of men invalided home during the year was 229, the equivalent ratio being 26·22 per 1,000, which is lower than in 1899 by 11·30, but higher than in the preceding ten years by ·97. In the Artillery the invaliding rate was 20·79 per 1,000, as compared with 20·53 in 1899. The highest ratio, 54·30 per 1,000, occurred in No. 13 Company, and the lowest, 4·80 per 1,000, in No. 1 Company, Southern Division. The Royal Engineers gave a ratio of 19·16 per 1,000, which is below the previous year's rate by 6·67. In the Infantry the ratio was 29·73 per 1,000, as compared with 42·56 in 1899, the ratios of the several battalions ranging from 64·15 per 1,000 in the 3rd Battalion Lancashire Fusiliers, and 25·86 per 1,000 in the 1st Battalion Royal Sussex Regiment; to 14·92 per 1,000 in the 1st Battalion Lancashire Fusiliers, and 18·35 per 1,000 in the 2nd Battalion Loyal North Lancashire Regiment. Taking the ages of the men sent home, it is found that 46, or 29·15 per 1,000, were under 20 years of age; 96, or 26·46 per 1,000, were between 20 and 25; 47, or 21·10 per 1,000, were between 25 and 30; and 42, or 32·33 per 1,000 were over 30 years of age. In the previous year the corresponding ratios were 25·00, 40·70, 43·20, and 33·54 per 1,000 respectively. As to length of service in the Command, 197 of those invalided, or 25·86 per 1,000, were in their first year; 71, or 28·80 per 1,000, were in their second year; 14, or 17·92 per 1,000, were in their third year; 9, or 33·96 per 1,000, were in their fourth year; and 10, or 32·25 per 1,000, had been more than four years in the Command, the corresponding ratios in 1899 being 35·26, 45·06, 37·95, 21·74 and 29·13 per 1,000 respectively.

The chief causes of invaliding were:—Mediterranean fever 43 cases, or 4·92 per 1·000 (the ratio for "other continued fevers" being 5·61, as compared with 14·63 in 1899); diseases of the circulatory system 38 cases (including 22 of disordered action and 13 of valvular disease of the heart), or 4·35 per 1,000, an increase of 1·91 per 1,000; diseases of the nervous system 27 cases, or 3·09 per 1,000, a decrease of ·05; tubercular diseases

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21 cases, or 2·40 per 1,000, an increase of 1·01; rheumatism 10 cases, or 1·15 per 1,000, an increase of ·80; and debility 10 cases, or 1·15 per 1,000, a decrease of ·36 per 1,000 as compared with 1899.

There were 68 men discharged the service as medically unfit, the ratio being 7·79 per 1,000, which is lower than that for the previous year by 9·40, and than the average rate for the preceding ten years by 3·78. The principal causes of discharge were:—diseases of the nervous system 24 cases, or 2·75 per 1,000, a decrease of ·96 per 1,000 as compared with the previous year (16 cases, or 1·83 per 1,000, being due to mental disease); diseases of the circulatory system 14 cases (including 7 of valvular disease and 6 of disordered action of the heart), or 1·60 per 1,000, a decrease of 1·42; tubercular diseases 7 cases, or ·80 per 1,000, a decrease of 1·41; and diseases of the eye 6 cases, or ·69 per 1,000, an increase of ·46 as compared with the ratio in 1899.

OFFICERS.—The average strength was 253, and there were 235 cases of sickness, 1 death, and 28 cases of invaliding, the equivalent ratios being 928·8, 3·95, and 110·67 per 1,000, as compared with 812·2, 4·08 and 85·71 in the preceding year. Among the cases treated were 55 cases of simple continued fever, 20 of injuries, 17 of Mediterranean fever, 17 of hepatic affections, 13 of diarrhœa, 12 of mouth and throat affections, 10 of synovitis, and 9 cases each of influenza and ague. Two cases of enteric fever also occurred. The death was due to Mediterranean fever. The causes of invaliding were Mediterranean fever 15 cases, eczema and fracture 2 cases each, and one case each of enteric fever, rheumatism, meningitis, delusional insanity, pneumonia, congestion of liver, synovitis, inflammation of connective tissue, and œdema of connective tissue.

WOMEN.—In an average strength of 414 there were 262 cases of sickness and 7 deaths, equal to ratios of 632·8 and 16·91 per 1,000, which are higher than the corresponding ratios in 1899 by 57·5 and 4·36 respectively. The cases included 52 of debility, 27 of simple continued fever, 26 cases of diseases incidental to women, 15 cases each of bronchial affections and dyspepsia, 10 of Mediterranean fever, 9 of tonsillitis and 8 of anæmia. No cases of enteric fever occurred. Two deaths were due to Mediterranean fever, and one each to alcoholism, malignant new growth, hæmorrhage of the brain, clots in the heart, and Bright's disease.

CHILDREN.—There were 484 attacks of sickness and 30 deaths in an average strength of 709, the equivalent ratios being 682·6 and 42·31 per 1,000, as compared with 496·7 and 40·84 in 1899. Among the cases treated were 117 of bronchitis, 52 of diarrhœa, 50 of simple continued, and 3 of Mediterranean fever, 40 of whooping cough, 25 cases each of debility and eczema, 22 of enteritis, 13 each of conjunctivitis, tonsillitis and wounds, and 10 of anæmia. There were no cases of enteric fever. The deaths were 5 from bronchitis, 4 each from debility and enteritis, 3 each from simple continued fever and diarrhœa, 2 from tubercle, and one each from idiopathic anæmia, eclampsia, scleritis, valvular disease of heart, gangrene of mouth, disorders of dentition, abscess of connective tissue, suffocation from submersion and suffocation from overlaying.

VACCINATION.—The majority of the vaccinations during the year were carried out with lymph from the Army Vaccine Institute, Aldershot. In some cases the lymph had to be obtained locally, pending the arrival of a supply from England. Of 133 primary vaccinations among children, 48 were failures, and of 40 re-vaccinations, 15 were successful. There were 136 re-vaccinations among the men, failure resulting in 39 instances. Only one woman was re-vaccinated during the year a "modified" result being obtained.

II.—Royal Malta Artillery.

The average strength of non-commissioned officers and men of this corps was 814, the principal statistics of sickness and mortality among them being given in the following table :— *Malta.*

1900. Average Strength.	Admissions.	Deaths.			Invalids.		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids Sent Home.	Invalids finally Discharged.	Constantly Sick.
814	247	2	—	2	—	8	11·10	303·4	2·46	—	9·83	13·64

The admission and constantly sick rates are lower than in 1899 by 83·4 and 4·21 per 1,000, and than the average rates for the preceding ten years by 175·5 and 6·19 respectively, and the death rate was higher than in the previous year by 1·14, but lower than the decennial average ratio by ·22 per 1,000.

The average sick time to each soldier was 4·97 days as compared with 6·52 in the previous year, and with 7·24, the average period for the preceding ten years ; the average duration of each case of sickness, 16·40 days, is shorter than in 1899 by ·45 of a day, but longer than the decennial average period by 1·29 days.

The sickness, mortality, &c., arranged according to the various sections of disease, will be found in Abstract IIIa.

General Diseases.—Influenza caused 14 admissions as compared with 1 in 1899. No case of enteric fever occurred. There were 20 cases of simple continued fever, the ratio being 24·6 per 1,000, as compared with 59·2 in 1899, and 59·4, the decennial average rate. Tubercular disease furnished 4 admissions and 2 deaths, 3 of the admissions and both the deaths being due to tubercle of the lungs.

Primary syphilis caused 3, secondary syphilis 2, and gonorrhœa 6 admissions, a total of 11 admissions for venereal diseases, or a ratio of 13·5 per 1,000, as compared with 27·6 in 1899, and 38·0, the decennial average rate.

Three cases of rheumatism and 12 of debility occurred, and among other general diseases were 2 cases of cyst, and one case each of non-malignant new growth and congenital malformations (webbed fingers).

Local Diseases.—Diseases of the nervous system were represented by one case each of neuralgia and mania. There were 8 cases of ophthalmic affection 7 being due to conjunctivitis and 1 to stye. Other organs of special sense included 3 cases of inflammation of the external meatus, 2 cases of epistaxis, and 1 case of perforation of the membrana tympani.

Diseases of the circulatory system were represented by 1 case of valvular disease of the heart. Diseases of the respiratory system caused 19 admissions, 15 being for bronchitis and 4 for pneumonia. For diseases of the digestive system there were 35 admissions, of which 14 were for sore throat, 10 for colic, 5 for diarrhœa, 3 for inflammation, and 1 each for abscess of the dental periosteum, tonsillitis and piles.

There was 1 case of inflammation of the lymphatic glands, and diseases of the generative system were represented by 2 cases of orchitis, and 1 case each of stricture of urethra, and ulcer of penis. Two admissions are recorded as synovitis, and of 14 admissions for diseases of the connective tissue 10 were due to abscess and 4 to inflammation. There were 34 admissions for various forms of skin diseases, of which boils furnished 10, ulcers 9, and erythema 4 cases.

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INJURIES.—Of 53 cases of local injury, 24 were due to wounds, 17 to blisters of feet, 7 to contusions, 2 each to sprain and fracture, and 1 to burns and scalds, the ratio of prevalence being 65·1 per 1,000, as compared with 73·7 in 1899, and with 101·3, the average rate.

INVALIDING.—There were 8 men discharged during the year as medically unfit for further service, or a ratio of 9·83 per 1,000, which is lower than the ratio for the previous year by 4·64, and than the average rate by 2·76. The causes of invaliding were tubercle, tubercle of lung, debility, mania, conjunctivitis, valvular disease of the heart, synovitis, fracture, one case each.

OFFICERS.—There were 16 cases of sickness in an average strength of 30, comprising 4 cases each of influenza and digestive disorders, 2 cases each of simple continued fever, abscess of connective tissue, and contusion; and rheumatism and sprain, 1 case each.

WOMEN AND CHILDREN.—In an average strength of 80, 2 cases of sickness are recorded. Among the children there were 13 admissions in an average strength of 180. The chief causes of admission were, bronchitis 3 cases, and 2 cases each of influenza, simple continued fever, and diarrhœa.

VACCINATION.—Amongst children there were 20 primary vaccinations, all successful. Of 170 re-vaccinations among recruits failure resulted in 10 cases. All vaccinations were performed with preserved lymph.

RECRUITING.—The number of men who presented themselves for medical examination on enlistment for the Royal Malta Artillery was 191, of whom 68 were rejected. The majority of the men were, as in past years, labourers and husbandmen from the country districts, and the chief causes of rejection were under chest measurement 18, defective vision 13, disease of heart 7, and under height 6 cases. Out of the 123 men found fit for service 67 were unable to read.

SANITARY CONDITIONS.

I.—MALTA.

The Principal Medical Officer (Surgeon-General T. O'Farrell, M.D., A.M.S.) commenting on the general health of the troops, remarks on the sickness among the large number of fresh troops which joined the Command. In connection with the sanitary reports from the various districts, the following are the principal points noted:—

Floriana District.—The lighting and ventilation of the various barracks in this district is not all that could be desired, but the defect is due to their construction and cannot be remedied. The facilities for ablution are satisfactory but hot water is noted as being required to be laid on to the baths, as it is at present obtained from the kitchen, and this arrangement is not conducive to cleanliness during the winter months. The reconstruction of the drainage at St. Francis referred to in last year's report was completed during the early part of the year. The kitchen at Floriana barracks requires enlarging. Five new latrines and urinals have been constructed at the west end of row of barrack-rooms at Floriana, and it is noted that the old latrines, wash-house and cook-house (which are in one building, and too close together) should be separated. The canteens at Floriana and St. Francis are noted as being inadequate.

At *Valletta Hospital* the following improvements have been carried out; a new ablution and bath room, and additional water-closets have been provided for the use of patients in the large special ward; the serjeants' water-closet has been removed to the same room as contains the water-closets for the special ward, the doors being labelled and locked to prevent their being

used by patients; one of the married quarters has been re-appropriated and is being converted into an operating room. Among several defects noted during the year the following are stated to be receiving consideration :—the lighting of the hospital, the warming of the hospital in winter, insufficiency of barrack accommodation for the Royal Army Medical Corps, &c. The ventilation and lighting of the bedrooms in the *Camerata* married quarters are again referred to. The means of ablution are stated to be insufficient, and it is noted that the existing trough system of water-closets and latrines which are quite unsuitable for such a building should be replaced by modern water-closets. *Malta.*

Marsamuscetto, and *Old Laboratory Barracks.*—The water-closets and urinals situated near the guard-room at Marsamuscetto require to be remodelled, and a new cistern and wash-down pan is recommended for the officers' water-closet. The dry-earth system and the latrines at the Old Laboratory should be abolished and the water-carriage system substituted. At the Government Bakery a water tap "unfit for drinking" which is inside the bake-house should be removed. The building is infested by rats, but measures are being adopted to get rid of them.

At *Lower St. Elmo* a new building has been erected to contain latrines and urinals, and the renewal of the barrack room floors is in hand. The drainage is being re-modelled so as to join the main civil drainage system instead of, as formerly, being emptied into the harbour in the proximity of the barracks.

At *Upper St. Elmo* the ablution rooms and latrines are noted as being badly ventilated, dark, and inconveniently situated.

In the *Tigné District* the old huts are being replaced by permanent stone barracks constructed with the latest modern improvements. New baths and ablution rooms have also recently been built.

Manoel.—The barrack rooms on the north side are not considered satisfactory, nor well ventilated. There are only a few married quarters, the majority of the married men living in hired lodgings in the town of Sliema. These quarters are, in many instances, unsatisfactory from a sanitary point of view. The proximity of these barracks to the Lazaretto (where all infectious diseases are treated) and the quarantine station, and the fact that cases of small-pox have from time to time occurred there, render them unsuitable for occupation by a large number of troops, and it has been suggested that they be handed over to the civil authorities, and quarters for another battalion provided at St. George's.

Isola District.—The barracks, which consist for the most part of old casements, are again referred to as being defective in ventilation, and it is noted that they might be improved by enlarging the windows generally.

At *Polverista* the serjeants' mess is too small, and a urinal and water-closet are noted as being required. Drinking water is recommended to be supplied to the infant school, and to the barrack rooms situated on the verandah at *St. Paul's*. A new latrine and urinal has been erected at these barracks. The drainage system in the district, which has hitherto been unsatisfactory, is being overhauled, and many of the old and choked up drains are being replaced by new ones. The whole system is expected to be in a satisfactory state at an early date.

Ricasoli District.—At *Fort Ricasoli* the insufficient lighting and bad ventilation of the serjeants' mess is again referred to, and the bath accommodation is noted as being insufficient. The drains in the officers' mess, urinal and kitchen were repaired, and the drainage in several places in the barracks renewed. Additional latrine accommodation was provided and drinking water was laid on to the recreation room. A bath and ablution room is much required at *Fort Della Grazia*. At *Fort San Leonardo* the drainage from the cook-house to the ablution room has been reconstructed and a drinking water tap was erected in the courtyard at *Fort San Rocco*.

In the *Verdala District* two of the barrack rooms were closed owing to their being badly ventilated and lighted. Four new baths have been erected during the year. The drainage system is not considered satisfactory, but will be improved when the new system has been established. The drainage of *St. Nicholas* married quarters was reconstructed. In con-

Malta.

nection with the laundry for the troops at Corradino prison, the erection of a moist heat disinfecting apparatus is recommended.

At *Cottonera Hospital* it is noted that the floors, which are of absorbent stone, should be replaced by some impervious material.

The accommodation at *Forrest Hospital*, although supplemented by tents, was insufficient. To meet the requirements, a new hospital is about to be built at St. Julians.

At *St. George's Barracks* (formerly called Pembroke Camp) a new block of officers' quarters was constructed. The smallness of the married quarters, which in some cases consist of only one large room, is commented on. A scullery is to be added to each of these. The remaining portion of the main drainage has been relaid, and automatic flushing tanks have been installed at head of main drain.

At *Fort Madalena* and *Spinola Battery* aqueduct water has been laid on to a large concrete underground tank in the fort, from which it can be pumped for drinking and cooking purposes.

At *Citta Vecchia Sanitorium* 590 patients were treated during the year, as compared with 584 in 1899. 231 were direct admissions from Imtarfa and Mellieha Camp, the remainder being transfers from the various station hospitals. The dining-room at the women's sanatorium is noted as being rather dark, as well as being hot in summer. The barrack accommodation for the hospital staff is to be improved. A bath has been added to the ablution room during the year.

At *Imtarfa* the underground tank which contains part of the drinking water has been improved. The bath accommodation which is inadequate, has been rectified as far as possible by the provision of temporary baths. A new block of ten married quarters is ready for occupation and the new hospital is approaching completion.

At *Mellieha Camp* the general sanitary condition is satisfactory. Concrete floors are noted as being necessary for the kitchens in the officers' and serjeants' messes, and also for the meat store.

At *Gozo* it is noted that drinking water taps should be supplied to the barrack rooms. The drainage is satisfactory, but a flushing tank is required at head of main drain. A larger kitchen for the hospital is much required.

Royal Malta Artillery.—At Fort Lascaris the erection of a third story is recommended to obviate the necessity of having men continuously under canvas at Calcara Camp. At the regimental hospital the floor, which was formerly of soft stone, was cemented, thus rendering it impermeable and more capable of being cleaned. No ration is issued, but the men get fourpence daily in lieu.

II.—Crete.

Crete.

Towards the end of 1899, the international troops were reduced to a strength of about 500 men at each station. The British force was stationed at Kandia, and the Senior Medical Officer (Major S. G. Allen, R.A.M.C.) reports that the health of the garrison was satisfactory, the sanitation of the camp good, and the water supply of a satisfactory character.

The men were accommodated in huts throughout the year and it is noted that the fact of the men not being obliged to live under canvas may have had something to do with the diminution of cases of malaria. To prevent the spread of malaria by the medium of mosquito larvæ, the water tanks are regularly cleaned out, and all "chance" water near the camp was either drained off or treated with chloride of lime. The corrugated zinc roofs of all the huts were whitewashed at the beginning of the summer to render them cooler. Four new cells were also constructed during the year.

The accommodation in the stationary field hospital was reduced to 57 beds, and one of the wards vacated was converted into a reading and dining room for the patients. Ablution huts have been built adjoining each

barrack room. Bathing parades are held twice a week in summer, and arrangements exist whereby the men can have hot baths at a cheap rate in the town, in winter. *Crete.*

The issue of the field ration laid down in the Allowance Regulations was discontinued in March, and the ordinary ration is now issued. The men supplement this by purchases of vegetables and fruit, which are abundant and cheap as a rule.

The hospital diets and extras have on the whole been satisfactory, but the difficulty of obtaining an adequate supply of fresh milk is again commented on. By arrangement with the contractor a special breed of Russian cows was imported, but these animals often ran dry soon after arrival. Goats milk was supplied to make up deficiencies, but even this was not always obtainable in sufficient quantity and had often to be supplemented by tinned milk.

The sanitary officer, in his report on the town of Kandia, states that, on the whole, the sanitary state of the town has been satisfactory.

V.—ON THE HEALTH OF THE TROOPS SERVING IN THE DOMINION OF CANADA.

Sickness and Mortality.

Canada. The average strength of the troops serving in the Command was 1,768, of whom 1,453 were stationed at Halifax, N.S., and 315 at Victoria, British Columbia. The troops stationed in the Command throughout the year were Nos. 3, 19 and 20 Companies, Western Division, and the District Establishment, Royal Garrison Artillery, Nos. 18 and 40 Companies and supernumerary staff, Royal Engineers, and detachments of the Army Service Corps, Royal Army Medical Corps, Army Ordnance Corps, Army Pay Corps, and Garrison Staff.

The second half of No. 44 Company and No. 48 Company, Royal Engineers, arrived at Victoria, B.C., from England in May. The 1st Battalion Leinster Regiment proceeded to England for service in South Africa in March, being relieved by the 3rd (Special Service) Battalion Royal Canadian Regiment of Infantry, which was raised in Canada and joined in April; seven companies being stationed at Halifax, N.S., and one company at Victoria, B.C.

The following table shows the admission, mortality, and invaliding rates &c., among the troops in the Command :—

1900. Average Strength.	Admissions.	Deaths.			Invalids.		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids Sent Home.	Invalids finally Discharged.	Constantly Sick.
1,768	1,638	10	2	12	14	11	61·82	926·5	6·79	7·92	6·22	34·97

In comparison with the previous year there is a increase of 310·9 in the admission rate, 1·85 in the mortality rate, and 9·88 in the ratio of constant inefficiency.

Compared with the average ratios for the preceding ten years the admission, mortality and constantly sick rates are higher by 401·4, 3·12, and 11·10 per 1,000 respectively.

The average sick time to each soldier was 12·77 days, which is longer than the corresponding period in 1899 by 3·61, and than the decennial average period by 4·06 days. The average duration of each case of sickness was 13·78 days, which is shorter than in the preceding year by 1·09 days, and than the average period by 2·81 days.

In Abstract XXIX is a table showing these health statistics for the various corps which served in the Command during the year. Excluding detachments, the highest admission rate was 1410·4 per 1,000 in the 3rd (Special Service) Battalion Royal Canadian Regiment, the next being in No. 3 Company, Western Division, Royal Garrison Artillery, with 926·3, closely followed by the 1st Battalion Leinster Regiment, with 916·7. The Royal Engineers taken together gave an admission ratio of 333·3, but the second half No. 44 Company and No. 48 Company, stationed at Victoria,

B.C., furnished ratios of 555·6 and 607·1 per 1,000 respectively. Of the deaths 6, including that of an invalid sent home, occurred in the Royal Artillery, 2, one being that of an invalid, in the Royal Engineers, and 4 in the Infantry. The highest constantly sick rate was 51·03 per 1,000, in the 1st Battalion Leinster Regiment, followed by 46·44 in the 3rd Battalion Royal Canadian Regiment, while the lowest, 15·70 per 1,000, was in the Royal Engineers. *Canada.*

With regard to the influence of age on the sickness and mortality, the admission rate among men under 20 years of age was 1798·9, per 1,000, among men between 20 and 25 years 1091·0, among men between 25 and 30, 610·7, among men between 30 and 35, 519·6, and among men over 35 years of age, 290·9 per 1000. In the previous year the highest ratio was amongst men between 20 and 25 years of age, and the lowest, as in the year under report, in men over 35. Of the deaths 1, or 5·29 per 1,000, occurred among men under 20, 3, or 3·74 per 1,000, among men between 20 and 25, 3, or 6·15 per 1,000, among men between 25 and 30, 2, or 11·17 per 1,000, among men between 30 and 35, and 1, or 9·09 per 1,000, among men over 35 years of age.

As to service in the Command, men in their first year gave an admission ratio of 1277·3 per 1,000, men in their second year 668·7, men in their third year 581·9, while men with over three years in the Command gave 235·0. In the previous year the highest rate occurred in men in their second year and the lowest in men with over three years' service in the Command. As regards the deaths, 4, or 4·28 per 1,000, occurred among men in their first year, 1, or 2·98 per 1,000, among men in their second year, 2, or 6·69 per 1,000, among men in their third year, and 3, or 15·00 per 1·000, among men with over three years' service.

In Abstract IV will be found the sickness, mortality, &c., arranged according to the different sections of disease.

General Diseases.—There were 30 admissions for *eruptive fevers*, 3 being for measles, 11 for rubella, and 4 for scarlet fever. The admission ratio, 17·0 per 1,000, is above that of the previous year by 6·5, and that of the decennial average by 12·5 per 1,000. *Influenza* was the cause of 220 admissions, giving a ratio of 124·4 per 1,000, which is higher than in the previous year and than the decennial average rate by 77·4 and 107·7 respectively. The disease prevailed throughout the year, but chiefly between February and May, and the large increase in the number of admissions was attributed to the mobilization of the 3rd Battalion Royal Canadian Regiment when the weather was severe and changeable.

Enteric fever caused 3 admissions, equal to a ratio of 1·7 per 1,000; in the previous year no admission occurred, and the average rate for the preceding ten years was ·5. The first case, which occurred in June in the city of Halifax, was attributed to defective ventilation of the main sewer, but in the other two cases which occurred at Wellington Barracks, Halifax, the cause could not be ascertained, although it is noted that there were some cases among the civil population in the neighbourhood at the time. The cases were mild and all recovered.

For *simple continued fevers* there were 7 admissions, giving a ratio of 4·0 per 1,000, as compared with *nil* in the previous year, and with 1·4 the decennial average rate.

One case of *dysentery* was admitted, and for *ague* there were 4 admissions, equal to a ratio of 2·3 per 1,000; in the previous year only a single case was recorded. *Septic diseases* were represented by 2 cases of erysipelas.

Tubercular Diseases caused 2 admissions, both for tubercle of the lung, the equivalent ratio being 1·1 per 1,000, which is below the previous year's rate and the decennial average rate by 3·2 and 1·8 respectively.

Venereal Diseases.—There were 32 admissions for *primary syphilis*, or a ratio of 18·1 per 1,000, showing an increase of 3·3, as compared with the rate for 1899, but a decrease of 7·0 in comparison with the average rate. If to this be added the sickness from soft chancre, for which there were 8 admissions and ·56 constantly sick, the admission rate for all primary venereal sores equals 22·6 per 1,000, which is higher than the previous year's rate by 6·6, but below the average decennial rate by 9·1.

Canada.

Secondary syphilis caused 25 admissions and gave a ratio of 14·1 per 1,000, showing a decrease as compared with the ratio of the previous year and the preceding ten years of 1·4 and 2·5 respectively. There was one death.

Under *gonorrhœa* 249 admissions are recorded, giving a ratio of 140·8 per 1,000, which is higher than the rate in the previous year by 81·5, and than the decennial average rate by 82·6. The increase in the admissions for gonorrhœa is attributed chiefly to the 3rd Battalion Royal Canadian Regiment.

The total admission rate for all forms of venereal disease was 177·5 per 1,000, or above the rate for 1899 by 86·7 and the average rate for the preceding ten years by 71·0. The number of men constantly sick from all classes of venereal disease was 16·36, equal to a ratio of 9·95 per 1,000, or higher than the rates for the previous year and the preceding ten years by 5·18 and 3·61 respectively.*

Parasitic Diseases caused 8 admissions, namely, 3 for scabies, 2 each for phthirius inguinalis and ringworm, and 1 for tinea versicolor, the ratio per 1,000 being 4·5, which is lower than the ratio for the previous year and the decennial average rate by 5·4 and 7·1 respectively.

For *alcoholism* there were 16 admissions, including 1 for delirium tremens. The ratio per 1,000, 9·1, is higher than the previous year's rate by 7·2 and than the decennial average rate by 5·7. The large increase was chiefly caused by the number of admissions from the Royal Canadian Regiment.

Rheumatism.—Under this head there were 62 admissions, including 13 for rheumatic fever, the ratio, 35·1 per 1,000, being higher than that of the previous year and than the decennial average rate by 17·2 and 7·9 respectively.

Under *debility* only 1 admission is recorded as compared with 2 in the preceding year, while under the heading of *other general diseases* there were 16 admissions, equal to a ratio of 9·1 per 1,000, which is below the previous year's rate by 7·0, but above the decennial average rate by 1·2. Of the cases 8 were for anæmia, 4 for non-malignant new growth, 3 for mumps, and 1, which proved fatal, for malignant new growth.

Local Diseases.—Under *diseases of the nervous system* there were 20 admissions, including 2 for mental disease, the ratio, 11·3 per 1,000, showing an increase on the ratio for 1899 and on the average rate for the preceding ten years of 2·6 and 2·9 respectively. The admissions were 6 each for vertigo and neuralgia, 4 for epilepsy, 2 for melancholia, and 1 each for inflammation of nerves and apoplexy.

Diseases of the Eye were represented by 16 admissions, 12 being for conjunctivitis and 1 each for ulceration of the cornea, scleritis, iritis, and blepharitis marginalis. The ratio of admission was 9·1 per 1,000, showing a decline in comparison with the previous year's rate of 3·3, while compared with the decennial average rate no change has occurred. For *other organs of special sense* there were 17 admissions, 14 being for aural disease; the ratio, 9·6, showing an increase as compared with ratio for the previous year and the decennial average rate of 5·3 and 3·7 respectively.

Diseases of the Circulatory System were the cause of 9 admissions, equal to a ratio of 5·1 per 1,000, which shows a decrease as compared with the ratio for 1899 and that of the decennial average of 2·9 and 1·6 respectively. The cases comprised 4 of disordered action and 2 of valvular disease of the heart, and one each of hypertrophy of heart, aneurysm, and varix. One death occurred from valvular disease of the heart in an invalid who had left the command.

Diseases of the Respiratory System.—There were 114 admissions shown under this head, with 3 deaths. The admission rate equalled 64·5 per 1,000, or higher than the rate in the previous year and than the average rate by 39·1

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* There were 7 admissions for ulcer of penis of non-venereal origin, with ·24 men constantly sick. If, as in former years (prior to 1897), these cases were included with those of primary syphilis and soft chancre under the heading of primary venereal sores, the admission and constantly sick rates for all venereal diseases would equal 131·5 and 9·39 respectively.

and 33·3 respectively. There were 72 cases of bronchitis, 14 of pneumonia (3 fatal), 11 laryngitis, 8 hæmoptysis, 6 pleurisy, 2 spasmodic asthma, and 1 of empyema. *Canada.*

Diseases of the Digestive System gave 258 admissions, the equivalent ratio being 145·9 per 1,000, which is higher than the ratio for 1899 and that of the ten years' average by 55·7 and 67·9 respectively. The cases were 149 affections of mouth and throat, 45 of dyspepsia, 13 of diarrhœa, 13 piles, 10 each inflammation of stomach and hernia, 9 of colic, 3 each of enteritis and inflammation of liver, and 1 each of gastralgia, fistula in ano, and jaundice. There were no deaths in the Command under this heading, but an invalid who had been sent home died from inflammation of liver.

Diseases of the Lymphatic System caused 8 admissions, giving a ratio of 4·5 per 1,000, which is below the previous year's rate and that of the decennial average by 4·2 and 12·6 respectively. Of the cases 6 were due to inflammation and 2 to suppuration of the lymph-glands.

Diseases of the Urinary System furnished 9 admissions and 1 death. The admission ratio, 5·1 per 1,000, is higher than that given in 1899 by 3·9 and than the decennial average rate by 2·9. The cases were 6 of cystitis, 2 of incontinence of urine, and 1 of Bright's disease, which proved fatal.

Diseases of the Generative System.—Under this heading 60 admissions are recorded, including 8 cases of soft chancre, already referred to under venereal diseases. Among the remaining cases were 24 of orchitis, 13 of balanitis, 7 of ulcer of penis (non-venereal), 3 of stricture of urethra, 2 of phimosis, and 1 each of paraphimosis, pruritis, and varicocele. The ratio of prevalence was 33·9 per 1,000, which is higher than that for the previous year and than the decennial average rate by 20·3 and 11·2 respectively.

Diseases of the Organs of Locomotion were represented by 25 admissions, 12 being for synovitis, 10 for myalgia, and 3 for inflammation of bursæ. The ratio, 14·1 per 1,000, is higher than the rate in the preceding year and than the average rate by 8·5 and 4·5 respectively.

For *diseases of the connective tissue* there were 43 admissions, 24 being for abscess and 19 for inflammation, the ratio of admission, 24·3 per 1,000, being higher than that for 1899 by 6·4 and than the decennial average rate by 2·4.

Diseases of the Skin caused 96 admissions, equal to a ratio of 54·3 per 1,000, which shows an increase on the previous year's rate of 6·7 and on the decennial average rate of 18·6. The chief causes of admission were, as in 1899, boils, eczema, ulcers, and whitlow.

INJURIES.—Under *general injuries* 2 admissions are returned, viz., 1 for scald and 1 for suffocation from submersion in Halifax Harbour. In the latter case artificial respiration was well carried out and animation restored, and after five days' treatment in hospital the man was able to return to duty.

Two deaths occurred out of hospital, one being that of a gunner, Royal Garrison Artillery, who was accidentally drowned by the upsetting of a boat at Victoria, B.C., and the other a private of the 3rd Royal Canadian Regiment, accidentally drowned in Halifax Harbour. *Local injuries* were 280 in number, including 79 for wounds, 69 for contusions, 68 for sprains, 40 for blisters of feet, 14 for fractures, 4 for burns and scalds, and 3 for dislocations.

A death occurred from self-inflicted gunshot wound of head. At the coroner's inquest a verdict of suicide whilst temporarily insane was returned the presumed motive being domestic troubles.

The admissions for injuries of all kinds gave a ratio of 159·5 per 1,000, which is below that in the preceding year by 9·8, but above that of the ten years' average by 62·3.

SURGICAL OPERATIONS.—A gunshot wound of the right hand (accidental) necessitated the amputation of index finger and thumb with excision of fragments of bone. The man was invalided home and discharged the service. Empyema and pleurisy following influenza necessitated incision and drainage. The man was discharged the service in the Command

Canada.

There were also 2 operations for the radical cure of hernia, 1 for hæmorrhoids, and 1 for varicocele.

The anæsthetic used in 5 of the cases was chloroform, chloroform followed by ether in 1 case, and ether in the remaining case.

INVALIDING.—The number of men sent to England as invalids during the year was 14, equal to a ratio of 7·92 per 1,000, which is lower than in 1899 by 12·48 and than the decennial average by 5·54.

The ratio of men invalided in the Artillery was 9·76, in the Engineers 4·39, in the Infantry 7·96, and in other corps *nil*.

Of the men invalided, 2, or 2·49 per 1,000, were between 20 and 25 years of age, 10, or 20·49 per 1,000, were between 25 and 30 years, 1, or 5·59 per 1,000, was between 30 and 35 years, and 1, or 9·09 per 1,000, was over 35 years of age. There were no invalids among men under 20 years of age. As to service in the Command, 2 men, or 2·14 per 1,000, were in their first year, 3, or 8·95 per 1,000, were in their second year, 6, or 20·07 per 1,000, were in their third year, and 3, or 15·00 per 1,000, had over three years' service in the Command. The causes of invaliding were, circulatory disorders 4 cases (3 being for valvular disease and 1 for aneurysm), respiratory affections 3 cases (1 each for bronchitis, hæmoptysis, and pleurisy), nervous diseases 2 cases (including 1 of mental disease), and 1 each for tubercle of lung, secondary syphilis, cystitis, synovitis, and gunshot wound.

There were 11 men (including 4 discharged locally) finally discharged as medically unfit, the equivalent ratio being 6·22 per 1,000, which is below the rate in the previous year and the decennial rate by 3·67 and 3·91 respectively. The causes of discharge were as follows :—Circulatory disorders 3 cases (2 for valvular disease of the heart and 1 for aneurysm), nervous diseases 3 cases (including 2 for mental disease and 1 for epilepsy), tubercle of lung 2 cases, and 1 case each rheumatism, empyema, and gunshot wound. The cases discharged locally comprised 1 each of tubercle of lung, rheumatism, melancholia, and empyema.

OFFICERS.—The average strength was 73, and there were 39 cases of sickness, equal to a ratio of 534·2 per 1,000, as compared with 352·9 in the previous year. The admissions included 11 for influenza, 8 for bronchitis, 3 for rubella, 2 each for rheumatism, inflammation of stomach, synovitis and sprains, and single cases of other disorders.

WOMEN.—In an average strength of 137 there were 57 admissions, equal to a ratio per 1,000 of 416·1, which is above the rate in the previous year by 96·1. The cases included 15 of influenza, 5 each of rheumatism, anæmia, and bronchitis, 4 of sore throat, 3 of dyspepsia, and 6 of diseases incidental to women.

CHILDREN.—The average strength was 231, and there were 165 admissions and 3 deaths, giving ratios of 714·3 and 12·99 per 1,000 respectively, the former being above the rate in the previous year by 224·5 and the latter lower by 10·82. Among the cases were 48 of bronchitis, 33 of digestive disorders, 27 of whooping-cough, 17 of mumps, and 10 of eruptive fevers, including 5 of scarlet fever, 3 of measles, and 2 of rubella. The deaths were due to whooping-cough, bronchitis, and pneumonia.

VACCINATION.—There were 164 primary vaccinations and 643 re-vaccinations among the men, with 13 and 129 failures respectively. The recruits for the 3rd (Special Service) Battalion Royal Canadian Regiment raised during the year were the cause of these unusually high figures. Amongst the women 4 primary vaccinations and 1 re-vaccination all resulted successfully, and amongst the children there were 1 primary vaccination and 2 re-vaccinations, one of the latter resulting in failure. All the above were performed with lymph obtained locally, chiefly from Montreal.

With lymph from the Army Vaccine Institute, Aldershot, there were 1 case of primary vaccination and 3 of re-vaccination amongst the men, 1 of drimary vaccination amongst the women, 19 of primary vaccination and 2 of

re-vaccination amongst the children ; failure resulting in only 2 instances in the primary vaccinations among children. *Canada.*

The Principal Medical Officer remarks that the results obtained from the Army Vaccine Institute lymph were more successful than in previous years and are attributed to the lymph being received after the cold season and used more quickly on its arrival.

Sanitary Conditions.

The Principal Medical Officer (Colonel W. McWatters, R.A.M.C.) states that no insanitary condition is noted in the reports of the medical officers as having affected the health of the troops during the year.

Halifax.—At the Citadel the new block of barracks under construction in 1899 for 105 non-commissioned officers and men was completed with all modern improvements of drainage, ventilation, hot-water pipes and electric lighting. In the older portion of the barracks the guard-room, cells and prisoners' room were enlarged ; a casemate was fitted up to provide an extra room for the tailor's shop, which was too small; a new pattern boiler was fitted to the kitchen and an extra Warren's cooking range provided ; several of the old floors have been removed, the damp soil excavated, and the whole area concreted and the floors renewed with hard wood. No. 9 casemate was fitted with 7 water latrines, and 7 urinals with automatic flushing, the room being heated with hot-water pipes ; the floor of the canteen beer-store was concreted and concrete yards were constructed for storing the urine tubs during the day. Ventilators were provided in the barrack and guard-rooms at R.A. Park, Halifax. A new ablution-room containing a bath and nine basins, with hot and cold water laid on, has been built for these barracks.

At George's Island a bath was provided for the ablution-room, also a new dry-earth latrine and ash-bin.

At the musketry camp, McNab's Island, a nitrifying tank urinal was erected for trial towards the end of the season and was apparently so satisfactory that it was recommended for further trial next season. At Wellington Barracks the drainage for south end of soldiers' block was reconstructed, and the electric light was kept on all night in the passages near the urine tubs.

In the Station Hospital, Halifax, the ablution accommodation was improved by the substitution of new basins in slate beds for the old ones on wooden benches. In five small wards hot-water radiators were supplied, and in four of these the windows on the east side were bricked up.

A Washington Lyons disinfector, with Alliot and Paton's improvements, was erected at the back of the hospital, in a convenient out-house, for disinfecting bedding and clothing by superheated steam. Schering's formalin disinfector for rooms has also been added to the hospital equipment. There were also several minor improvements during the year at the various other barracks.

Victoria, B.C.—At Work Point a double-storied barracks together with a block for officers and married quarters were built, and the station hospital at Victoria, B.C., was enlarged to contain sixteen beds.

An incinerator, designed by Major W. G. Bissell, New York National Guard, has been sanctioned for trial at Rodd Hill Battery, Victoria, B.C., for the destruction of excrement, and a similar one for the burning of refuse at the musketry camp, McNab's Island, Halifax, N.S., during the coming season.

VI.—ON THE HEALTH OF THE TROOPS SERVING IN BERMUDA.

Sickness and Mortality.

I.—European Troops.

Bermuda. The average strength of warrant officers, non-commissioned officers, and men serving in the Command during the year was 632, and the garrison throughout the year was composed of No. 21 Company, Western Division, and No. 8 Company, Southern Division, Royal Garrison Artillery, Nos. 3, 27, and 36 Companies, Royal Engineers, the European non-commissioned officers 1st West India Regiment, and detachments Army Service Corps, Royal Army Medical Corps, Army Ordnance Corps, and Garrison Staff.

No arrivals or departures took place during the year.

The following table shows the admission, mortality, and invaliding rates, &c., among the troops in the Command :—

1900. Average Strength.	Admissions.	Deaths.			Invalids.		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids Sent Home.	Invalids finally Discharged.	Constantly Sick.
632	233	3	—	3	6	12	11·67	368·7	4·75	9·49	18·99	18·46

The admission, and constantly sick rates are lower than in 1899 by 10·7 and 2·00, but the death rate is higher by 2·99, while in comparison with the decennial average rates, the admission, death, and constantly sick rates show a decrease of 135·0, 3·60, and 8·64 per 1,000, respectively.

The average sick time to each soldier was 6·74 days, which is shorter than in the previous year by ·73 of a day and than the decennial average period by 3·15 days. The average duration of each case of sickness was 18·28 days which is shorter than in 1899, and than the average period by 1·41 and 1·36 days, respectively.

In Abstract XXIX is a table showing the health statistics for the different corps which served in the Command during the year. Omitting detachments and the Europeans of 1st Battalion West India Regiment, the highest admission and constantly sick rates were 643·4 and 21·16 per 1,000 in No. 21 Company Western Division Royal Garrison Artillery, while the lowest admission rate was 313·1 per 1,000 in No. 8 Company Southern Division Royal Garrison Artillery, and the lowest constantly sick rate, 18·64, in No. 36 Company Royal Engineers. Of the deaths 1 occurred in the Royal Artillery with a ratio of 3·04 per 1,000, 1 in the Royal Engineers giving a ratio of 4·37 per 1,000, and 1, or 16·67 per 1,000, in Garrison Staff and Departments.

As to influence of age on sickness and mortality, the admission rate among men under 20 years of age was 437·5 per 1,000, among men between 20 and 25 years 380·0, among men between 25 and 30 years 382·4, among men between 30 and 35 years of age 468·3, and among men over 35 years of age 61·2 per 1,000, the corresponding ratios in 1899 being 323·5, 428·9, 346·1,

283·0, and 207·6 per 1,000, respectively. All the deaths occurred among men between 25 and 30 years of age, giving a ratio of 12·61 per 1,000. *Bermuda.*

According to length of service in the Command, the admission rate for men of less than one year's service was 561·4 per 1,000, for men in their second year 515·7, for men in their third year 279·3, and for those who had more than three years in the Command 301·6. In 1899 the highest ratio was among men in their first year, and the lowest was, as in the year under report, among men in their third year of service in the Command. Of the deaths, 1, or 6·29 per 1,000, occurred among men in their second year; 1, or 3·45 per 1,000, among men in their third year; and 1, or 7·94 per 1,000, among men with over three years in the Command.

The admissions, deaths, &c., according to the different sections of disease, will be found in the table given in Abstract V.

GENERAL DISEASES.—There were only 2 cases of *influenza* as against 24 cases in the previous year, the ratio being 3·2 per 1,000, as compared with 14·1 in the preceding year, and 11·5, the decennial average rate.

Enteric Fever caused 7 admissions, equal to a ratio of 11·1 per 1,000, which is lower than that in the previous year by ·7, and than the decennial average rate by 14·7. As in the previous year there was no death. Of the men attacked 3, or 12·00 per 1,000, were between 20 and 25 years of age, and 4, or 16·81, were between 25 and 30 years. As to service in the Command, 1, or 17·54 per 1,000, had less than 1 year; 1, or 6·29 per 1,000, was in his second year; and 5, or 17·24 per 1,000, were in their third year. Of the cases, 4 came from St. George's, 2 from Watford, and 1 from Prospect. The admissions by months were, 1 in January, 1 in February, 1 in July, 3 in August, and 1 in November.

The careful supervision of sanitary details, to which the decline of enteric fever has been attributed, is still consistently carried out with satisfactory results. But the main feature of the decline is its coincidence with the gradual replacement of the dry earth system of conservancy by a water carriage system.

Other continued fevers caused 11 admissions, or a ratio of 17·4 per 1,000, which, compared with the previous year's ratio and that of the decennial average, is less by 7·3 and 3·7 respectively. All were due to simple continued fever.

For *dysentery* there were 5 admissions, giving a ratio of 7·9 per 1,000, which is higher than the previous year's rate by 6·1, and than that of the average by 5·8. There was one death.

Malarial fever gave no admissions during the year, and *tubercular diseases* were also unrepresented.

Venereal diseases.—There were 4 admissions for *primary syphilis*, equal to a ratio of 6·3 per 1,000, which is 3·4 above the previous year's rate. If to this be added the sickness from soft chancre, for which there were 2 admissions and ·08 men constantly sick, the total admission ratio for primary venereal sores amounts to 9·5 per 1,000, which is higher than the ratio for the previous year by 6·0, but lower than the decennial average rate by 1·0. *Secondary syphilis* with 2 admissions gave a ratio of 3·2 per 1,000, which is lower than the rate in the preceding year, and than the decennial average rate by 8·0, and 11·0, respectively. *Gonorrhœa* furnished 20 admissions, giving a ratio of 31·6 per 1,000, which is higher than the previous year's rate by 17·5, and than the decennial average rate by 12·4. Including all forms of venereal disease the total admission ratio is 44·3 per 1,000, which shows an increase of 15·5 as compared with the ratio given in the previous year, and a fractional increase on the decennial average rate. The ratio of constantly sick for these diseases was 2·43 per 1,000, or ·39 less than in the previous year, and 1·51 below the average ratio.*

The Senior Medical Officer notes in his remarks, that many of the attacks from this disease are accounted for by being contracted previous to the arrival of the troops in the Command.

Parasitic diseases.—There were 11 admissions, all for scabies, recorded under this head, equal to a ratio of 17·4 per 1,000, which is higher than that

* There were no admissions for ulcer of penis of non-venereal origin.

la. in the previous year by 15·1, and than the average for the preceding ten years by 6·2.

Under *alcoholism* 2 admissions are shown, one being for delirium tremens. The ratio, 3·2 per 1,000, shows a fractional increase on the previous year's rate, but is less than the decennial average rate by 4·6 per 1,000.

Rheumatism gave 10 admissions, equal to a ratio of 15·8 per 1,000, which is above that for 1899 by 10·5, but fractionally below the average rate. One of the admissions was due to rheumatic fever.

For *debility* there were 12 admissions, giving a ratio of 19·0 per 1,000, which is higher than the previous year's rate and that of the decennial average by 14·3 and 11·3 respectively. Under *other general diseases* no admission is recorded.

Local Diseases.—*Diseases of the Nervous System* caused 8 admissions, giving a ratio of 12·6 per 1,000, which, compared with the rate in the previous year and that of the decennial average, is higher by 9·6 and 5·2 respectively. The cases were 3 of neuralgia, 2 of epilepsy, and one each of multiple neuritis, headache, and nervous weakness. No case of mental disease was recorded, but a case of melancholia, which remained in hospital at the end of the previous year, was invalided to England.

Diseases of the Eye were represented by 1 case of conjunctivitis, and *diseases of other organs of special sense* by a single case of rhinitis.

Diseases of the Circulatory System caused 8 admissions, or a ratio of 12·6 per 1,000, being above the rate for 1899 by 10·8 and that of the decennial average by 7·9. The admissions comprised 3 for varix, 2 for disordered action of the heart, and one each for pericarditis, valvular disease of the heart and angina pectoris.

Diseases of the Respiratory System gave 6 admissions, equal to a ratio of 9·5 per 1,000, showing a decline of ·5 and 11·3 as compared with the previous year's rate and the decennial average rate respectively.

Diseases of the Digestive System caused 37 admissions, giving a ratio of 58·5 per 1,000, which is an increase on the previous year's rate of 10·3, but below the average rate for the preceding ten years by 29·5. The admissions included 14 for dyspepsia, 10 affections of the mouth and throat, 6 diarrhœa, 3 hernia, and 2 each inflammation of intestines, and hepatic diseases.

Diseases of the Lymphatic System gave only 2 admissions with a ratio of 3·2 per 1,000, which is lower than the rate for 1899 and that of the decennial average by 2·1 and 3·7 respectively.

Diseases of the Urinary System gave 2 admissions, both for acute nephritis. The ratio, 3·2 per 1,000, is higher than that in the previous year by ·9 and than the average rate by 1·1.

Diseases of the Generative System.—There were 6 admissions recorded, equal to a ratio of 9·5 per 1,000, which is higher than the rate in 1899 by 1·3 but lower than the decennial rate by 2·4 per 1,000. The admissions, omitting those already referred to under venereal disease, were 2 for stricture of the urethra, and 1 each paraphimosis and balanitis.

Diseases of the Organs of Locomotion were represented by an admission each for thecal abscess and bunion, which gave a ratio of 3·2 per 1,000, showing a decrease in comparison with the previous year's and the decennial average ratios of 1·5 and 5·7 respectively.

Diseases of the Connective Tissue gave 12 admissions, 9 for inflammation and 3 for abscess. The ratio, 19·0 per 1,000, is lower than the previous year's rate and that of the decennial average by 32·8 and 16·9 respectively.

Diseases of the Skin were the cause of 10 admissions, the ratio, 15·8 per 1,000, being lower than that for 1899 by 21·9 and than the decennial average rate by 21·2. There were 3 cases of boil, 2 of whitlow and single cases of other affections of the skin.

Injuries.—There were 50 admissions, the equivalent ratio being 79·1 per 1,000, which is below the previous year's rate and that of the decennial average by ·9 and 24·4 respectively.

There was only one admission for *general injury*, shown as heat-apoplexy, but there were two deaths recorded under suffocation from submersion, one of which occurred in January at St. George's, in which the coroner's

verdict was "found drowned," and the other in March at Ordnance Island, the verdict being "accidentally drowned." The admissions under *local injuries* were mainly due to contusions, wounds, and sprains. *Bermuda.*

POISONS.—A severe case of ptomaine poisoning, from eating tinned salmon, is recorded under this heading.

SURGICAL OPERATIONS.—The only operation of any importance was in a case of stricture of urethra in which external urethrotomy was performed. The anæsthetic used was chloroform. The man improved somewhat but was ultimately invalided to England.

INVALIDING.—The number of men sent home as invalids was 6, giving a ratio of 9·49 per 1,000, which is below the previous year's rate by 4·04, and the decennial average ratio by 2·90.

The invaliding ratio in the Royal Garrison Artillery was 6·08 and the Engineers 13·10. No case of invaliding occurred among Garrison Staff and Departments.

With regard to age, 2 men, or 8·00 per 1,000, were between 20 and 25 years of age, 2, or 8·40 per 1,000, were between 25 and 30 years, and 2, or 25·32 per 1,000, were between 30 and 35 years of age.

As to service in the Command, 4 men, or 25·16 per 1,000, were in their second year and 2, or 6·90 per 1,000, were in their third year of service.

The causes of invaliding were :—2 for debility and 1 each for epilepsy, melancholia, valvular disease of the heart, and stricture of urethra.

There were 12 men discharged the service as medically unfit during the year, the ratio being 18·99 per 1,000, which is higher than in 1899 by 11·34 and than the average rate for the ten years 1890–99 by 11·90. The causes of discharge were :—2 each for tubercle of lung, epilepsy, and melancholia, and 1 each for debility, glaucoma, perforation of the membrana tympani, deafness, varix, and fracture.

OFFICERS.—In an average strength of 55 there were 8 attacks of illness, the admission rate being 145·5 per 1,000, which is lower than in the previous year by 100·6. The cases treated comprised 1 case each of enteric fever, simple continued fever, debility, gastritis, hepatitis, abscess of liver, acute nephritis, and inflammation of connective tissue. There was no death, but 2 officers were invalided to England, one each for debility and abscess of liver.

WOMEN.—The average strength was 83, with 28 cases of sickness and 1 death. The admission rate was 337·4, and that of death 12·05 per 1,000, as compared with 420·3 and 7·25 in the preceding year. Among the cases treated were 7 of debility, 4 of tubercle of lung, 3 of mania, and 3 of ailments peculiar to women. The death was due to tubercle of lung.

CHILDREN.—In an average strength of 159, there were 17 cases of sickness and 4 deaths, giving ratios of 106·9 and 25·16 per 1,000 respectively, which are lower than in the previous year by 206·7 in the former and 8·74 in the latter comparison. The deaths were 2 from diarrhœa, and 1 each from immaturity at birth, and meningitis.

VACCINATION.—Of 23 primary vaccinations amongst the children 14 were failures, and 1 case of re-vaccination was successful. There was only one re-vaccination amongst the men which resulted in failure. In all the cases except 8 (children) the lymph came from the Army Vaccine Institute. The number of failures is attributed to the deterioration of the lymph during its passage across the Atlantic and from climatic causes. In the 8 cases above mentioned, which were all successful, the lymph was obtained from the United States of America.

II.—Non-European Troops.

Bermuda.

The average strength of non-commissioned officers and men, exclusive of the European sergeants, of the 1st Battalion West India Regiment, which arrived from Sierra Leone in the latter part of 1899, and constituted the only non-European troops stationed in the Command, was 775.

The following table shows the admission, mortality, invaliding rates, &c.:—

1900. Average Strength	Admissions.	Deaths.			Invalids.		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent to West Indies.	Finally Discharged.		Admissions.	Deaths.	Invalids sent to West Indies.	Invalids finally Discharged.	Constantly Sick.
775	425	17	—	17	49	24	31·96	548·4	21·93	63·22	30·96	41·24

The average sick time to each soldier was 15·05 and the average duration of each case of sickness 27·45 days.

The principal statistics of sickness and mortality, arranged according to the various sections of disease, are shown in Abstract VI.

General Diseases.—There were 4 admissions for *influenza* equal to a rate of 5·2 per 1,000, and 1 admission for *dysentery*, or 1·3 per 1,000.

Malarial fevers caused 51 admissions or a ratio of 65·8. Of the cases 30 were ague and 21 remittent fever, but none of the cases were contracted in the Command, where the disease is almost unknown.

Tubercular Diseases were the origin of 14 admissions and 6 deaths, the respective ratios being 18·1 and 7·74 per 1,000. Of the cases 8 were for tubercle of lung, and 6 general tubercle. The Senior Medical Officer remarks that these troops appear to be very liable to this disease, and the climate is inimical to their successful treatment, most of the cases terminating fatally, if not quickly invalided.

Venereal Diseases.—There were 11 admissions for *primary syphilis* giving a ratio of 14·2 per 1,000. If to this be added the sickness for soft chancre for which there were 6 admissions with ·67 men constantly sick, the total admission rate for primary venereal sores equals 21·9 per 1,000. *Secondary syphilis* with 22 admissions gave a ratio of 28·4 per 1,000, and *gonorrhœa* with 34 admissions gave a ratio of 43·9 per 1,000. Taking all forms of venereal disease together, the admission ratio was 94·2 per 1,000, and that for constantly sick 12·15 per 1,000. Many of the attacks are said to have been contracted previous to arrival in the Command.

Parasitic Diseases.—Caused 31 admissions of which 28 were for scabies.

Alcoholism.—No admission occurred under this head.

Rheumatism caused 24 admissions, giving a ratio of 31·0 per 1,000.

Debility caused 11 admissions, equal to a ratio of 14·2 per 1,000, and *other general diseases* gave only 1 admission, or 1·3 per 1,000.

Local Diseases.—*Diseases of the Nervous System* caused 3 admissions, 1 being for locomotor ataxia and 2 for neuralgia.

For *diseases of the eye* 17 admissions were recorded equal to a ratio of 21·9 per 1,000; while *diseases of other organs of special sense* gave 5 admissions or a ratio of 6·5 per 1,000. Conjunctivitis was the chief cause of admission in the former; the latter were mainly aural affections.

Diseases of the Circulatory System were the origin of 37 admissions and 6 deaths for which the ratios per 1,000 were 47·7 and 7·74 respectively. Of the cases 18 were for disordered action of heart, 15 for valvular disease of heart (with 6 deaths), and 1 each for endocarditis, dilatation of heart, embolism and varix. It is remarked that these troops are very prone to diseases of the heart, which is attributed to malarial poisoning, and to possibly the early faulty hygienic condition of their surroundings.

Diseases of the Respiratory System.—47 admissions are recorded under this head with 2 deaths, the corresponding ratios being 60·6 and 2·58 per 1,000. Of the cases 32 were for bronchial affections, 8 pneumonia (with the 2 deaths), 4 asthma, 2 laryngitis, and 1 pleurisy.

Diseases of the Digestive System were the cause of 26 admissions and 2 deaths, the equivalent ratios being 33·6 and 2·58 respectively. There were 9 cases of diarrhœa, 5 of dyspepsia, 3 of colic, 2 of tonsillitis, and 1 each abscess dental periosteum, ulceration of stomach, enteritis, hernia, piles, hepatitis, and peritonitis. The deaths were due to ulceration of stomach and peritonitis.

Diseases of the Lymphatic System accounted for 6 admissions, 5 being for inflammation of lymphatic glands, and 1 for congestion of the spleen. The ratio per 1,000 equalled 7·7.

Diseases of the Urinary System furnished 7 admissions or a ratio 9·0 per 1,000. There were 3 cases of Bright's disease, 3 of acute nephritis, and 1 of cystitis.

Diseases of the Generative System gave 18 admissions equal to a ratio of 23·2 per 1,000. In addition to the 6 cases of soft chancre, previously referred to under venereal diseases, there were 5 cases of stricture of urethra, 3 balanitis, 2 orchitis, 1 ulcer of penis, and 1 urethral fever.

Diseases of the Organs of Locomotion caused 8 admissions, of which 6 were for synovitis and 1 each for periostitis and ankylosis. The ratio of admission was 10·3 per 1,000. There were 11 admissions or a ratio of 14·2 per 1,000 for *diseases of the connective tissue*, 5 of the admissions being for abscess, 5 for inflammation, and 1 œdema.

Diseases of the Skin were the cause of 16 admissions, the ratio per 1,000 being equal to 20·6. Ulcers, eczema, and boils were the chief causes of admission.

INJURIES.—For *local injuries* there were 20 admissions, caused by wounds, contusions, sprains, and dislocations, and there was 1 death under *general injuries*, a case of suffocation from submersion (accidental).

INVALIDING.—The number of men sent to the West Indies as invalids was 49, equal to a ratio of 63·22 per 1,000.

With regard to age 1 man, or 45·45 per 1,000, was under 20 years, 19 men, or 59·19 per 1,000, were between 20 and 25 years, 24, or 79·47 per 1,000, were between 25 and 30 years, and 5, or 46·73 per 1,000, were between 30 and 35 years of age.

As to service in the Command 37 men, or 53·01 per 1,000, had less than 1 year in the Command and 12, or 155·84 per 1,000, had between 1 and 2 years in the Command.

The causes of invaliding were:—remittent fever 3 cases, tubercular diseases 7 cases (3 being for tubercle of lung), secondary syphilis 8, rheumatism 3, debility 3, disordered action of heart 7, valvular disease of heart 6, Bright's disease 2, stricture of urethra 2, and locomotor ataxia, inflammation of membrana tympani, embolism, spasmodic asthma, pneumonia, inflammation of lymphatic glands, ankylosis, and ainhum one case each.

There were 24 men discharged the service as medically unfit, equal to a ratio per 1,000 of 30·96. Among these were 1 case of remittent fever, 9 cases of tubercular disease (7 being for tubercle of lung), 4 secondary syphilis, 1 rheumatism, 4 valvular disease of heart, 3 disordered action of heart, 1 embolism and 1 ainhum.

WOMEN.—In an average strength of 28 there were 4 attacks of illness, equal to a ratio of 142·9 per 1,000. The cases were one each of simple continued fever, remittent fever, abortion and opium poisoning.

CHILDREN.—In a strength of 19 there were 3 admissions, and 2 deaths. The admission rate was 157·9, and that of mortality 105·26 per 1,000. The cases were 2 of inherited syphilis, both fatal, and 1 disorders of dentition.

Bermuda.

VACCINATION.—There were 16 cases of primary vaccination among the children, 14 with preserved lymph from the Army Vaccine Institute, and 2 with preserved lymph from the United States of America.

With the former lymph there were 13 failures and 1 perfect pustule, while the latter gave 2 perfect pustules. Of re-vaccinations there were 14 cases, 8 among the men and 6 among the women, in which preserved lymph from the Army Vaccine Institute was used; all, with the exception of 1 among the women, resulting in failure.

SANITARY CONDITIONS.

The Senior Medical Officer (Colonel G. D. N. Leake, R.A.M.C.) reports that the general sanitary condition of the several stations in the Command has been satisfactory and the health of the troops very good.

It is noted that a few dry earth latrines still remain, but steps are being taken to replace them, as far as possible, by a water-carriage system. The need of a destructor for consuming ash bin refuse, and the provision of a modern and efficient disinfector at one or more of the station hospitals are also pointed out.

The Senior Medical Officer recommends the total abolition of the practice of letting land near barracks and quarters to farmers, who manure the land with all kinds of filth, and thus practically cancel in a day or two all the good effected by the efforts of Medical Officers and others to keep the barracks clean and in good sanitary order.

The principal sanitary improvements at the various stations embrace the following :—

At *Prospect* new water-system latrines have been taken into use, the sewage being discharged into the sea by a main drain.

The dry earth latrines at the Bungalow married quarters have been replaced by four water closets. The water-carriage system for removal of sewage has been greatly extended, especially in connection with the erection of new buildings such as recreation room, officers' quarters, sergeants' mess, &c. A new spacious and well-built stone gymnasium is approaching completion. At Fort Langton, a water-closet has replaced the dry earth latrine, and a modern ash-bin has been provided.

At *St. George's* a new recreation room has been built, and a new stewards' quarters, fitted with water-closet, has been erected in the Station Hospital grounds.

At *Watford* the hospital roof has been renewed, the old slate roof being replaced by one of white stone. New medical stores are in course of erection on this island, to replace those destroyed by gales and storms at Boaz.

At *Boaz* a new recreation room has been completed. The insufficiency of the water supply, especially in connection with the married quarters, is commented upon. Nothing special was noted with respect to *Ireland Island.*

VII.—ON THE HEALTH OF THE TROOPS SERVING IN BARBADOS.

Sickness and Mortality.

I.—European Troops.

Barbados.

The average strength of the troops serving in Barbados during the year was 714.

The force consisted of No. 1 Company, Western Division, Royal Garrison Artillery, the District Establishment Royal Garrison Artillery, a detachment of the Royal Engineers, the headquarters and five companies of the 2nd Battalion Leinster Regiment and detachments of the Army Service, Royal Army Medical, Army Ordnance and Army Pay Corps.

The stations occupied were Barbados and St. Lucia, with an average strength of 463 and 251 respectively.

In the following table are given the admission, mortality and invaliding rates among the troops serving in the Command :—

1900. Average Strength.	Admissions.	Deaths.			Invalids.		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
714	597	5	2	7	14	7	41·73	836·1	9·80	19·61	9·80	58·45

The admission and constantly sick rates are lower than in 1899 by 223·6 and 24·91 respectively, and than the average rates for the preceding ten years by 485·8 and 25·45 in similar comparisons. The mortality rate is lower than in the previous year by 7·84, but is higher than the average ratio for the preceding ten years by 1·98. The average sick time to each soldier was 21·33 days, which is shorter than in the preceding year and than in the decennial period by 9·10 and 9·29 days respectively. The average duration of each case of sickness was 25·51 days, being shorter than in the previous year by 3·20 days, but longer than the average period by 2·35 days. In Abstract XXIX is a table showing these health statistics for the various regiments and corps which served in the Command during the year. In the Royal Artillery the admission ratio was 855·1 and the constantly sick ratio 48·04 per 1,000, as compared with 891·3 and 47·54 in the preceding year. In the infantry these rates were 890·2 and 65·66, as against 1187·4 and 100·06.

Of the deaths, 3, or 21·74 per 1,000, occurred in the artillery, and 4, or 7·71 per 1,000, in the infantry.

With regard to the influence of age on sickness and mortality, it is found that in men under 20 years of age with an average strength of 15 the admission rate was 866·7 per 1,000, but there was no death; among men between 20 and 25 years of age the admission rate was 923·1, and that of

Barbados.

mortality 6·99 per 1000 ; among men between 25 and 30 years, the admission rate was 785·1 and that of mortality 8·96 per 1,000 ; among men between 30 and 35 years of age the admission ratio was 865·3, but there was no death ; and among men over 35 years of age the admission ratio was 461·5 per 1,000, with no death. With regard to service in the Command, the admission ratio for men in their first year was 1090·9, and that of death 22·72 per 1,000, as compared with 801·9 and 12·58 in the previous year ; of men in their second year the admission and mortality ratios were 455·4 and 6·15 per 1,000, in comparison with 1322·0 and 12·99 respectively in 1899 ; men in their third year gave an admission ratio of 1066·9, but the death rate was *nil*, the corresponding ratios in the preceding year being 566·7 and 33·33 per 1,000 ; while men who had been more than 3 years in the Command with an average strength of 31 gave admission and death ratios of 2129·0 and 64·52 per 1,000 respectively ; in the previous year the average strength was only 4 and there were no admissions or deaths.

In Abstract VII is a table showing the principal statistics of sickness and mortality arranged according to the various sections of disease.

General Diseases.—There were 12 cases of *influenza* as compared with *nil* in the previous year, the ratio being 16·8 per 1,000. All the cases occurred during the period March to June, and were of a mild type.

Enteric fever caused 1 admission which terminated fatally. The case occurred in a gunner belonging to No. 1 Company, Western Division, Royal Garrison Artillery, stationed at St. Lucia, and the origin of the disease could not be traced. *Simple Continued Fever* caused 22 admissions, 10 at Barbados and 12 at St. Lucia, the ratio being 30·8 per 1,000, which is lower than that of the previous year, and than the decennial average rate by 23·5 and 67·6 per 1,000 respectively. *Dysentery* with 1 admission, or a ratio of 1·4, shows a decrease as compared with the previous year's rate and that of the average period of 2·7 and 1·3 respectively.

Malarial Fevers were the cause of 16 admissions, 6 of which were for remittent fever ; the admission ratio was 22·4 per 1,000 as compared with 28·5 and 77·5, the corresponding ratios for the previous year and the decennial average period. There was no death under this heading. There was no admission for *septic diseases.*

Tubercular diseases caused 7 admissions, 5 of which were for tubercle of lung, equal to a ratio of 9·8 per 1,000, which shows an increase on the ratio for the previous year, and on that for the decennial average of 5·7 and 7·8 respectively. There was 1 death from tubercle of lung.

Venereal Diseases.—There were 82 admissions for *primary syphilis*, equal to a ratio of 114·9 per 1,000, showing a decrease of 65·6 as compared with the previous year. If to this be added the sickness for soft chancre, for which there was 1 admission and ·01 men constantly sick, the total admission ratio for primary venereal sores equals 116·3 per 1,000, which is lower than the previous year's rate by 87·3 and than the rate for the decennial average by 80·2. *Secondary syphilis*, with 51 admissions, gave a ratio of 71·4 per 1,000, which is lower than in the previous year by 30·4, but higher than the decennial average rate by 6·0 per 1,000. A death occurred in an invalid who had left the Command.

Gonorrhœa caused 64 admissions, or a ratio per 1,000 of 89·7, which shows a decline of 36·5 and 100·2 respectively as compared with the rate in the previous year and the decennial average rate.

Taking all forms of venereal disease together, the total admission ratio was 277·4 per 1,000, which is lower by 154·2 than that of the previous year, and than the average decennial rate by 174·4 per 1,000. The ratio constantly sick, 25·41 per 1,000, shows a decrease in both comparisons to the extent of 23·37 and 14·65 respectively.*

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* There were 2 admissions for ulcer of penis of non-venereal origin, with ·11 men constantly sick. If, as in former years (prior to 1897), these cases were included with those of primary syphilis and soft chancre under the heading of primary venereal sores, the admission and constantly sick rates for all venereal diseases would equal 280·2 and 25 56 respectively.

Parasitic diseases gave 6 admissions, including 3 for ringworm. The ratio per 1,000 was 8·4, which shows a decrease of 6·5 and 11·2 as compared with the rate in the previous year and the decennial average rate, respectively. For *alcoholism* there were 14 admissions, giving an admission ratio of 19·6 per 1,000, as compared with 35·3 for the preceding year and 13·2 the average rate; all the cases occurred at Barbados. No case of delirium tremens is recorded. *Barbados.*

Rheumatism is represented by 19 admissions, 1 of which is shown as rheumatic fever, equivalent to a ratio of 26·6 per 1,000, as compared with 54·3, the rate in the previous year, and 50·7 the decennial average rate.

For *debility* there were 14 admissions, 4 at Barbados, and 10 at St. Lucia, giving a ratio of 19·6 per 1,000, as compared with 24·4 and 19·4 the ratios for the preceding year and the decennial average period respectively.

Under the heading of *other general diseases*, there were 3 admissions, comprising one case each of malignant new growth, non-malignant new growth and anæmia. An invalid who had left the Command died from malignant new growth.

Local Diseases.—Only one admission, for melancholia, is recorded under *diseases of the nervous system.*

Diseases of the Eye caused 2 admissions, or a ratio of 2·8 per 1,000, which is below the ratio given in the preceding year and that for the decennial average period by 2·6 and 10·5 respectively.

For *diseases of other organs of special sense* there were 12 admissions, equal to a ratio of 16·8 per 1,000, which shows an increase of 6·0 as compared with the ratio in the preceding year but a decrease of 10·3 in comparison with the decennial average rate. Of the admissions, 7 were due to inflammation of the external meatus and 5 to perforation of the membrana tympani.

Diseases of the Circulatory System.—There were 7 admissions, the equivalent ratio being 9·8 per 1,000, which shows a decrease as compared with the previous year's rate and the decennial average of 6·5 and ·6 respectively. There were 4 admissions recorded as disordered action of the heart, and 3 as valvular disease of the heart.

Diseases of the Respiratory System caused 13 admissions, giving a ratio of 18·2 per 1,000, which shows an increase of 4·6 as compared with the ratio of 1899, but a decrease of 4·4 when compared with the average ratio of the preceding ten years. Bronchial affections were the chief cause of admission. There was 1 death due to pneumonia.

Diseases of the Digestive System, with 58 admissions, gave a ratio of 81·2 per 1,000, showing an increase on the rate for the preceding year of 18·8. Compared with the decennial average rate, there is decrease of 26·6 per 1,000. The chief causes of admission were dyspepsia (18), hepatic affections (14), and diseases of the mouth and throat (11); one death occurred from inflammation of liver.

Diseases of the Lymphatic System gave a ratio of 50·4 per 1,000, being higher than the previous year's rate by 8·3 but lower than the decennial average rate by 6·1. Of the 36 cases of admission, 34 were for inflammation, and 2 for suppuration of the lymphatic glands. Only one admission (a case of Bright's desease) was returned under the *urinary system.* Under *diseases of the generative system* are shown 17 admissions, giving a ratio of 23·8, which is lower than the rate in the preceding year by 21·0, and than the average rate by 122·3. The admissions were principally for orchitis, inflammation of glans penis, and ulcer of penis. *Diseases of the organs of locomotion*, with 5 admissions, furnished a ratio of 7·0 per 1,000, a decrease of 3·8 and 6·5 as compared with the rate in the previous year and the decennial average rate respectively; all but one of the cases were for synovitis. There was one death due to necrosis of bone. *Diseases of the connective tissue* caused 19 admissions, or a ratio of 26·6 per 1,000, which is 1·9 and 19·5 respectively below the ratio for the previous year and that of the decennial average. *Diseases of the skin*, which were the cause of 33 admissions, gave a ratio of 46·2 per 1,000, being higher than the rate in 1899 by 5·5 but lower than the average rate by 20·6. The causes of admission were eczema, boils, psoriasis, ulcer and whitlow.

INJURIES caused 81 admissions, equal to a ratio of 113·5 as compared with 134·3 in the preceding year, and 132·5, the average rate for the preceding ten years. There were no admissions under *general injuries*.

Under *local injuries* 35 of the admissions were for wounds, 21 for contusions, 8 for abrasions, 8 for sprains, 5 from effects of irritants or corrosives, 3 for blisters of feet, and 1 for fracture.

SURGICAL OPERATIONS comprised excision of the right ulna for necrosis of bone, ligature of the brachial artery for wound of palmar arch, and division of the sphincter ani for fistula. In the first instance, although the wound continued to make satisfactory progress, the patient died six weeks after the operation from exhaustion; in the second the patient was invalided, and the third case was still in hospital at the end of the year. Chloroform was the anæsthetic used in each case.

INVALIDING.—The number of men invalided home from Barbados was 14, giving a ratio of 19·61 per 1,000, as compared with 24·42 in the previous year, and 24·93, the average ratio for the ten preceding years. Of the men invalided, 13 belonged to the 2nd Battalion Leinster Regiment, and 1 to No. 1 Company, Western Division, Royal Garrison Artillery. With regard to age, 6 men, or 20·98 per 1,000, were between 20 and 25 years, and 3 men, or 8·96 per 1,000, were between 25 and 30 years of age; 4 men, or 76·92 per 1,000, were between 30 and 35 years of age; and 1 man, or 38·46 per 1,000, was over 35 years of age. As to service in the Command, 1 man, or 22·72 per 1,000, had less than 1 year's service in the Command; 8 men, or 24·62 per 1,000, were in their second year, and 5 men, or 15·92 per 1,000, were in their third year of service in the Command.

The causes of invaliding were: secondary syphilis and valvular disease of the heart, 3 cases each, tubercle of lung, 2 cases, and tubercle, rheumatic fever, malignant new growth, melancholia, Bright's disease, and wound of hand, 1 case each.

There were 7 men discharged as medically unfit for further service, the ratio being 9·80 per 1,000 as compared with 4·07 in 1899 and 14·55, the decennial average rate. The causes of discharge were: melancholia and valvular disease of heart, 2 cases each, and 1 case each of dementia, tubercle of lung, and Bright's disease.

OFFICERS.—In an average strength of 46 there were 25 cases of illness, or a ratio of 552·2 per 1,000, being lower than in 1899 by 387·8. Among the cases treated were 5 for influenza, 3 for malarial fever, 5 for digestive disorders and 7 for local injuries. An officer was invalided for fracture of skull

WOMEN.—The average strength was 46, with 31 admissions into hospital. The admission ratio, which equalled 673·9 per 1,000, was lower than in the previous year by 517·6. The chief causes of admission were debility, influenza, and digestive disorders.

CHILDREN.—The average strength of the children was 72, and there were 57 admissions, or a ratio per 1,000 of 791·7, as compared with 493·8 in 1899. One death occurred, giving a ratio of 13·89 per 1,000, or 1·54 in excess of the rate in the previous year. The chief causes of sickness were bronchial affections, skin diseases, influenza, and digestive disorders. The death was due to inflammation of the intestines.

VACCINATION.—There were 16 cases of re-vaccination amongst the men, of which 11 were failures. Two re-vaccinations amongst the women were also failures. There were 28 primary vaccinations among children, of which 12 were successful; and of 20 re-vaccinations 6 were perfect and 14 failures. All the operations were performed with lymph from the Army Vaccine Institute, Aldershot, but the Senior Medical Officer remarks that the lymph evidently deteriorates on the way out.

II.—Non-European Troops.

Barbad

The average strength of the non-commissioned officers and men was 484. The force consisted of a detachment 2nd Battalion West India Regiment at Barbados; the St. Lucia Company, Royal Garrison Artillery, the West India Fortress Company, Royal Engineers, and a detachment 2nd West India Regiment at St. Lucia. The whole have been stationed at Barbados and St. Lucia throughout the year, with an average strength of 199 and 285 respectively.

The following table shows the admission, mortality, and invaliding rates among these troops:—

1900. Average Strength	Admissions.	Deaths.			Invalids.		Average constantly sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids sent Home.	Invalids finally discharged.	Constantly Sick.
484	396	2	—	2	—	33	27·03	818·2	4·13	—	63·18	55·85

Comparing the statistics of the Command with those for the previous year, the admission, mortality and constantly sick ratios have decreased by 252·0, 3·67 and ·29 per 1,000 respectively, and in comparison with the ratios for the decennial period a general decrease is also observed, the decrease in the admission rate being 341·0, in the mortality rate 6·57, and in the constantly sick rate 13·12 per 1,000.

The average sick time to each soldier was 20·28 days, or ·11 of a day shorter than in the previous year, and 4·79 days shorter than the average. The average duration of each case of sickness was 24·91 days, or 5·76 days longer than in the previous year, and 3·20 days longer than the average of the preceding ten years.

With regard to the sickness and mortality of corps in the Command, the 2nd Battalion West India Regiment stood highest, the admission rate being 867·2 and the death rate 5·41 per 1,000; the St. Lucia Company, Royal Garrison Artillery, came next in admission ratio, which was 693·9, but there were no deaths, and the West India Fortress Company, Royal Engineers, in which also there was no death, with an admission rate of 470·6 was lowest.

Taking the sickness and mortality among the troops by age it is found that in men under 20 years of age with an average strength of 8 there were 2 admissions, or a ratio of 250·0 per 1,000; in men between 20 and 25 years of age there were 93 admissions or a ratio of 830·4 per 1,000; in men between 25 and 30 years of age there were 272 admissions, or a ratio of 941·2 per 1,000; in men between 30 and 35 years of age there were 22 admissions, equal to a ratio of 349·2 per 1,000, and in men above 35 years of age with an average strength of 12 there were 7 admissions, giving a ratio of 583·3 per 1,000. In the previous year the highest admission ratio was among men between 20 and 25 years of age, with 1250·0 per 1,000, and the lowest among men under 20 years of age, with 434·8 per 1,000. The 2 deaths occurred among men between 25 and 30 years of age, giving a ratio of 6·92 per 1,000. In the previous year there were 3 deaths, or a ratio of 9·90 per 1000, among men between 25 and 30 years of age, and among men between 30 and 35 years of age there was 1 death, or a ratio of 19·23 per 1,000. No deaths occurred in any of the other age periods. With regard to length of service, the admission ratio was 857·1 per 1,000 among men in their first year, 666·7 among men in their second year, 1884·1 among men in their third year, and 530·6 among men with over three years' service. In the previous year the highest rate was among men in their third year and the lowest among men in their second year. The only mortality rate occurred among men in their third year of service, giving a ratio of 28·99 per 1,000.

In the previous year no death occurred among men in their third year, but men in their second year, and men who had more than 3 years' service furnished mortality ratios of 10·99 and 30·30 per 1,000 respectively.

In Abstract VIII will be found the sickness, mortality, &c., arranged according to the various sections of disease.

GENERAL DISEASES.—There were no cases of *eruptive fevers* during the year. *Influenza* furnished 28 admissions, equivalent to a ratio of 57·8 per 1,000. 21 of the cases occurred at Barbados, and 7 at St. Lucia, and were all of a mild nature. *Simple Continued Fever* caused 22 admissions, giving a ratio of 45·4 per 1,000, which shows a decrease, as compared with that of the previous year and the decennial average rate, of 63·7 and 26·5 per 1,000 respectively. For *dysentery* there was 1 admission, as against 6 in 1899 and 1 in 1898, the ratio, 2·1 per 1,000, showing a decrease on the ratios of the preceding year and the decennial average of 9·6 and 1·4 per 1,000 respectively. *Malarial Fevers* with 41 admissions, giving a ratio of 84·7 per 1,000, compares favourably with the previous year, in which comparison a decrease of 14·7 is shown, while it is 71·3 below the decennial average rate. 25 of the cases are returned as remittent fever. *Tubercular Diseases.*—There were 7 admissions under this head, with one death; the admission ratio, 14·5 per 1,000, shows an increase as compared with the previous year's ratio and with the average rate for the preceding ten years of 8·7 and 3·6 per 1,000 respectively, while the mortality rate is lower in both these comparisons by 1·83 and 2·30 per 1,000 respectively. 6 of the admissions and the death were due to tubercle of the lungs. *Venereal Diseases.*—The admissions for *primary syphilis* numbered 64, equal to a ratio of 132·2 per 1,000, which is lower than that of the previous year by 51·0 There were no cases of sickness from soft chancre. For *secondary syphilis* there were 42 admissions, which gives a ratio of 86·8 per 1,000, and is higher than the ratios of the previous year and the average of the preceding ten years by 32·2 and 35·3 respectively. *Gonorrhœa* caused 38 admissions, or a ratio of 78·5 per 1,000, which is lower than the ratio for 1899, and than the average for the preceding ten years by 63·8 and 68·5 respectively. Including all forms of venereal disease, the total admission ratio for the Command was 297·5 per 1,000, which is lower than the corresponding rate in the previous year and than the average rate by 88·4 and 90·6 per 1,000 respectively. The total amount of constant inefficiency on account of these diseases was 26·84 per 1,000, which is lower than the rate in the previous year by 5·09, and than the average rate by 4·98. For *parasitic diseases*, there were 5 admissions, 4 being for ringworm, and one for dracunculus medinensis. *Alcoholism* caused 1 admission as compared with 6 in 1899. *Rheumatism* was the cause of 10 admissions, giving a ratio of 20·7 per 1,000, which is 65·1 and 49·6 respectively below the rates of the previous year and the decennial average. *Debility* caused 9 admissions, equal to a ratio of 18·6 per 1,000, as compared with 29·2 in the previous year, and 12·2, the decennial average rate. *Other general diseases* gave 4 admissions, all being for non-malignant new growth.

LOCAL DISEASES.—*Diseases of the Nervous System.*—Four admissions are recorded, one each being for epilepsy, neuralgia, hysteria, and mania. The ratio, 8·3 per 1,000, is higher than that in 1899 by 2·5, but lower than the decennial average rate by 3·3. *Diseases of the Eye* accounted for 2 admissions, both for conjunctivitis, giving a ratio of 4·1 per 1,000, which shows a decrease as compared with the previous year's rate and that for the decennial average period of 15·4 and 18·8 respectively. Under *diseases of other organs of special sense* there were two admissions, both for inflammation of the external meatus. *Diseases of the Circulatory System* caused 4 admissions, 2 being for disordered action and 2 for valvular disease of heart. In 1899 there were 3 admissions, and the admission ratio for the year under report, 8·3 per 1,000, is higher than in the previous year by 2·5, but lower than the decennial average rate by 2·2. *Diseases of the Respiratory System* were the cause of 14 admissions, all cases of bronchial affection. The ratio per 1,000 equalled 28·9 per 1,000, which is lower than the ratio of the preceding year and that of the decennial average by 18·1 and 9·8 respectively. *Diseases of the Digestive*

System, with 32 admissions, furnished a ratio of 66·1 per 1,000, which, compared with the previous year, and with the decennial rate, shows a decrease of 37·3 and 21·3 respectively. The chief causes of admission were dyspepsia, and diseases of mouth and throat. One death occurred, due to inflamation of liver. *Diseases of the Lymphatic System* gave a ratio of 20·7 per 1,000, which is higher than the previous year's rate by 7·0 but lower than that of the decennial average by 18·4. *Diseases of the Urinary System* were represented by 4 admissions, comprising 3 cases of nephritis and 1 of Bright's disease. In 1899 no admissions were recorded under this heading. *Diseases of the Generative System* caused 8 admissions, equal to a ratio of 16·5 per 1,000, being 3·0 and 139·7 below the previous year's rate, and the average for the preceding ten years respectively. For *Diseases of the organs of locomotion*, there were 6 admissions, the ratio, 12·4 per 1,000, showing an increase of 4·6 on the previous year's ratio and of 4·1 on the decennial average rate. *Diseases of the Connective Tissue* were the cause of 9 admissions, giving a ratio of 18·6 per 1,000, which is a decrease as compared with the previous year's rate of 10·6 and of 11·8 in comparison with the average rate. *Diseases of the Skin* gave 9 admissions, or a ratio of 18·6 per 1,000, which, compared with the ratio for the preceding year and with the average rate shows a decrease of ·9 and 15·3 respectively. Ulcer and boil were the chief causes of admission.

INJURIES.—Twenty admissions are recorded under this head, the ratio being 41·3 per 1,000, which is higher than in the preceeding year by 2·3, but lower than the decennial average rate by 37·8 There was no case shown under *general injuries*, and the *local injuries* were represented by 9 admissions for wounds, 6 for contusions, 3 for sprains, and 1 each for abrasion and effects of irritants.

SURGICAL OPERATIONS.—There were none of any importance.

INVALIDING.—Thirty-three men were invalided from the service, 21 for secondary syphilis, 5 for tubercle of lung, and 1 each for remittent fever, rheumatism, valvular disease of heart, disordered action of heart, prolapse of rectum, Bright's disease, and synovitis. The ratio per 1,000 of men invalided the service, 68·18, is greater than in 1899 by 54·53 and than the average rate by 39·35. In remarking on the large increase as compared with the previous year, the Senior Medical Officer states that this "was due to the fact that all chronic venereal cases who never did any duty, but were always in hospital suffering from the above cause, were brought before a board and at once discharged from the service."

WOMEN AND CHILDREN.—The average strength of women was 19, and there were 5 admissions, giving a ratio 263·2 per 1,000; the admissions comprised 1 case each of influenza, rheumatism, anæmia, dyspepsia, and menorrhagia. The average strength of children was 11, and there was 1 admission for inflammation of intestines, equivalent to a ratio of 90·9 per 1,000.

VACCINATION.—There was only 1 primary vaccination amongst recruits which was successful; and of 18 re-vaccinations amongst soldiers other than recruits, half were failures. Amongst the women, there were 6 re-vaccinations all being failures. Of 4 primary vaccinations, and 3 re-vaccinations amongst the children, 2 of the former, and all the latter were failures. The lymph was obtained from the Army Vaccine Institute, Aldershot. It is noted that the recruits are invariably despatched to the Depôt at Jamaica, by the first mail after being finally approved, so that there is not sufficient time for vaccination to be carried out at Barbados.

RECRUITING.—Of 295 recruits medically inspected, 199 were rejected as unfit.

The chief causes of rejection were, under chest measurement 65, disease of heart 22, hernia 18, laxity of abdominal rings 12, ulcers, wounds, and cicatrices 11, and syphilis 8.

rbados. The average age, height, weight and chest measurement of the 96 found fit were as follows:—

Age	20·1 years.
Height	67·1 inches.
Weight	132·2 lbs.
Chest measurement	33·7 inches

and their state of education is given as:—

Well educated	1
Able to read and write	74
Able to read only	2
Unable to read	19

Sanitary Conditions.

The Senior Medical Officer (Lieut.-Colonel E. A. Roche, R.A.M.C.) reports that the health of the troops in the Command has been very good, the sanitation and barrack accommodation good, and the ventilation, cubic space, and superficial area, sufficient. The water supply is reported as having been abundant and of good quality. There was no epidemic of any kind among the troops. Sporadic cases of yellow fever occurred among the civil population, but the troops were free from attack. The precaution of daily burning the surface of the ground whenever virgin soil is disturbed during building operations is strictly carried out.

At *St. Lucia* the ceilings of married quarters were "pugged" and boarded to deaden noises; in two instances the verandah floor was replaced by concrete and the floor of the quarters renewed. At the station hospital a shelter for ponies was erected, and the surface gutters were improved. An additional bath room was provided for the officers' quarters.

At *Vigie* extensive building operations, including officers' mess, commanding officer's quarters, two barrack rooms with kitchens, sergeants' mess, and a new hospital for non-European troops, are approaching completion. A separate cook-house for European soldiers has been erected and a workshop provided for the Royal Artillery. At *La Toc* the surface channels were renewed with cement and an additional kitchen to the married quarters provided.

VIII.—ON THE HEALTH OF THE TROOPS SERVING IN JAMAICA.

Sickness and Mortality.

I.—European Troops.

Jamaica.

The average strength of the troops serving in Jamaica during the year was 566.

The troops stationed in the Command throughout the year were No 22 Company Southern Division and district establishment Royal Garrison Artillery, with Staff of the Jamaica Company Royal Artillery, Royal Engineers, Detachment 2nd Battalion Leinster Regiment, Staff of 2nd Battalion West India Regiment, &c., and Garrison Staff and Departmental Corps. The stations occupied by these were Newcastle, Port Royal, and Up Park Camp, with average strengths of 294, 152 and 120 respectively.

The following table shows the admission, mortality, and invaliding rates, &c., among the non-commissioned officers and men :—

1900. Average Strength.	Admissions.	Deaths.			Invalids.		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
566	342	3	1	4	13	6	25·01	604·2	7·07	22·97	10·60	44·19

The admission and constantly sick rates are lower than the corresponding ratios in the previous year by 190·9 and 9·75 per 1,000, and than those of the decennial average by 198·5 and 5·54 per 1,000 respectively, while the death-rate, 7·07 per 1,000, is exactly similar to that in the previous year, but is lower than the decennial average rate by 5·34. The average sick time to each soldier, 16·13 days, was shorter than in 1899 by 3·56 days, and than the decennial period by 2·02 days. The average duration of each case of sickness, 26·69 days, was longer than in the previous year and than the average rate by 1·93 and 4·08 days respectively.

In Abstract XXIX is a table showing the health statistics for the various regiments and corps which served in the Command during the year. As in 1899, No. 22 Company Southern Division Royal Garrison Artillery was highest, with an admission rate of 782·86, and the 2nd Battalion Leinster Regiment came next with 629·89 per 1,000. The lowest admission rate was 107·1 in the Garrison Staff and Departmental Corps, followed by the Royal Engineers with 327·9 per 1,000.

As in the previous year, there were 4 deaths, and of these, 3 were in the Infantry, and 1 in the Artillery, giving ratios of 5·26 and 10·10 respectively.

As to the influence of age on sickness and mortality, the admission rate among men under 20 years of age with an average strength of 5 was *nil*, among men between 20 and 25 years 989·5, among men between 25 and 30 years 484·6, among men between 30 and 35 years 280·0, and among those

Jamaica. above 35 years of age 171·4 per 1,000. The 3 deaths in the Command occurred among men between 20 and 25 years of age, giving a ratio of 15·71 per 1,000.

According to length of service in the Command, the admission ratio for men in their first year of service was 557·7 per 1,000, among men in their second year of service, the ratio was 732·0, among men in their third year 534·7, and among men who had been more than three years in the Command, with an average strength of 30, the ratio was 800·0 per 1,000. The highest ratio in the previous year was among men in their first year of service, with 876·5, and the lowest, excluding men who had been more than 3 years in the Command, and among whom there were no admissions, among men in their third year of service, with 400·0 per 1,000. The three deaths, or a mortality ratio of 19·61 per 1,000, occurred among men in their second year of service.

The admissions, deaths, &c, according to the different sections of disease will be found in Abstract IX.

GENERAL DISEASES.—*Eruptive Fevers* were represented by a single case of measles, which occurred at Newcastle. The ratio per 1,000 was 1·8.

Influenza caused 9 admissions, equivalent to a ratio of 15·9 per 1,000. No admission was recorded under this head in the previous year. All the admissions occurred during the months of April and May.

Enteric Fever gave 5 admissions with 1 death. The ratio of admission was 8·8, or 5·3 above the ratio for 1899, but below the average rate by ·4.

Four cases occurred at Newcastle, 3 being attributed to the drinking of impure water from a spring, and the fourth was that of a temporary orderly who had been employed nursing these cases. The remaining case, a fatal one, occurred at Up Park Camp, and was of obscure origin; but it is believed that the drinking of impure water outside camp was the cause.

Other Continued Fevers caused only 1 admission, equal to a ratio of 1·8 per 1,000, which was lower than the rate in the previous year and the decennial average rate by 40·6 and 63·1 respectively.

Dysentery gave 6 admissions, or a ratio of 10·6 per 1,000, showing an increase of 1·8 as compared with 1899, but a decrease of 1·3 as compared with the average ratio for the preceding ten years.

Malarial Fevers accounted for 33 admissions, all for remittent fever. 15 cases occurred at Newcastle, 12 at Up Park Camp, and 6 at Port Royal. The ratio of admission for malarial fevers, 58·3 per 1,000, was lower than the rate in the previous year by 23·0, but was fractionally higher than the ratio of the ten years' average.

Tubercular Diseases were represented by 3 admissions for tubercle of lung, and the ratio per 1,000, 5·3, is higher than the ratio of 1899 by 3·5, and than the average rate by 2·1. There was one death from tubercle of the lungs among invalids sent home.

Venereal Diseases.—There were 38 admissions for *primary syphilis*, equal to a ratio of 67·1 per 1,000, which shows in comparison with the previous year's rate a decrease of 5·3. If to this be added the sickness for soft chancre, for which there were 4 admissions and ·61 men constantly sick, the total admission ratio for primary venereal sores amounted to 74·2 per 1,000, being lower by 14·1 than in 1899 and than the average by 12·0. *Secondary syphilis* gave 21 admissions, or a ratio of 37·1, which is higher than the previous year's rate by 3·5, but lower than the average rate by 5·2.

Gonorrhœa was the cause of 53 admissions, giving a ratio of 93·7 per 1,000, which is lower than the ratio for the previous year by 8·8, but higher than the decennial average by 1·3. Including all forms of venereal diseases, the total admission rate was 205·0, which is lower than that for the previous year by 19·4 and than the average rate for the preceding ten years by 15·9.* The ratio for constant inefficiency amounted to 19·00, which is lower than the previous year's ratio by ·80, but higher than the average rate by 1·06.

Alcoholism was the cause of 3 admissions, equal to a ratio of 5·3 per 1,000, as compared with 12·4, the ratio in 1899, and 5·2 the decennial average rate.

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* There were no admissions for ulcer of penis of non-venereal origin.

Rheumatism.—There were 16 admissions, including one of gout, giving a ratio of 28·3, which is higher than the corresponding rate in the previous year and than the decennial average rate by 12·4 and 8·0 respectively. *Jamaica.*

Debility was the cause of 1 admission, being in the ratio of 1·8 per 1,000, and showing a decrease of 7·0 as compared with the previous year, and of 8·6 in comparison with the decennial average rate.

Other General Diseases were unrepresented.

LOCAL DISEASES.—*Diseases of the Nervous System* were the cause of 2 admissions, a case of inflammation of nerves and one of headache. The ratio of admission was 3·5 per 1,000, which is practically the same as in the previous year, but is lower than the average rate by 3·9.

Diseases of the Eye gave 7 admissions, or a ratio of 12·4 per 1,000, being higher than the previous year's rate by 7·1 and than the decennial average rate by 4·8. The cases comprised 5 of conjunctivitis, and 1 each of ulcerative keratitis and stye.

Diseases of other Organs of Special Sense gave 2 admissions, the ratio, 3·5 per 1,000 shows a decrease as compared with the ratio for the previous year and the decennial average rate of 5·3 and 2·3 respectively.

Diseases of the Circulatory System caused 2 admissions, equal to a ratio of 3·5 per 1,000, which is lower than the ratio of the previous year and the average rate by 12·4 and 5·5 respectively. The causes of admission were 1 case each of valvular disease of heart and varix.

Diseases of the Respiratory System caused 14 admissions, or a ratio of 24·7 per 1,000, which is higher than the ratio of the previous year and than the decennial average rate by 1·7 and 1·9 respectively. The admissions comprised 11 cases of bronchial affections and 1 case each of pneumonia, phthisis, and hæmoptysis.

Diseases of the Digestive System were the cause of 23 admissions, equal to a ratio of 40·6 per 1,000, which compared with the ratio for 1899, and with the decennial average rate shows a decrease of 24·8 and 28·1 respectively. The chief causes of admissions were: throat and mouth diseases, hepatic affections, dyspepsia, diarrhœa, and piles.

Diseases of the Lymphatic System, with 15 admissions, gave a ratio of 26·5 per 1,000, which is higher than the ratio in the previous year by 3·5, but lower than the decennial average rate by 4·1. All the admissions were for inflammation of the lymphatic glands.

Under *diseases of the Urinary System* there was only 1 admission, with a ratio of 1·8, a similar ratio to that of the previous year, but higher than the decennial average rate by 1·1.

Diseases of the Generative System caused 18 admissions, giving a ratio of 31·8 per 1,000, being lower than the ratio for 1899 by 3·5, but higher than the average rate by 3·0. Beside the 4 cases of soft chancre already referred to under venereal diseases, the cases included 5 for inflammation of testicle, 4 for inflammation of glans penis, and 2 for stricture of urethra.

Diseases of the Organs of Locomotion, with 5 admissions, gave a ratio of 8·8 per 1,000, being below the ratio of the previous year and the rate for the decennial period by 10·6 and 1·3 respectively. The admissions were all due to inflammation of joints.

Diseases of the Connective Tissues were the cause of 12 admissions, or a ratio of 21·2 per 1,000, a decrease as compared with the previous year and the decennial average period of 22·9 and 5·4 respectively, 8 of the cases being due to abscess, 3 to inflammation, and 1 to œdema of the connective tissue.

Diseases of the Skin, with 8 admissions, gave a ratio of 14·1 per 1,000, and show a decrease of 14·2 as compared with the previous year, and of 16·8 in comparison with the average rate. The causes of admission were 2 cases each of ulcer and boils, and 1 case each of eczema, carbuncle, whitlow, and onychia.

INJURIES.—There were 42 admissions under this head, equal to a ratio of 74·2 per 1,000, which shows a decrease of 49·5 on the previous year's ratio, and of 39·5 on the average rate. No admissions were recorded under *general injuries*, but under *local injuries* there were for wounds 21 admissions,

Jamaica. contusions 14, abrasions 3, sprains 2, and 1 admission each for blisters of feet and fracture of tibia and fibula. Two deaths occurred at Up Park Camp from gunshot wound (self-inflicted). A verdict of suicide was returned in both instances, and in neither case was any motive recorded.

SURGICAL OPERATIONS.—No major operations are recorded.

INVALIDING.—The number of men invalided home from Jamaica was 13, equal to a ratio of 22·97 per 1,000, which is lower than the previous year's rate, and than the decennial average ratio, by 21·73 and 2·03 respectively. Of the men invalided 6 belonged to No. 22 Company Southern Division Royal Garrison Artillery, giving a ratio of 34·29 per 1,000, 6 to the 2nd Battalion Leinster Regiment, with a ratio of 21·35 per 1,000, and 1 to the Garrison Staff and Departments, with a ratio of 35·71 per 1,000. With regard to age, 9 men were between 20 and 25 years, or 47·12 per 1,000; between 25 and 30 there were 2 men, or 7·69 per 1,000; between 30 and 35 there was 1 man, or 13·33 per 1,000; while over 35 years of age, with an average strength of 35, there was 1 man, or 28·57 per 1,000. The highest invaliding rate according to age, in 1899, was amongst men over 35 years of age, with 111·11 per 1,000, followed by men between 20 and 25 years with 57·85 per 1,000. With regard to service in the Command, 1 man, or 19·23, had under one year, 3, or 19·61, were in their second year, and 9, or 27·19 per 1,000, were in their third year in the Command. In 1899 the highest rate was among men in their third year with 85·71, followed by men in their rst year with 59·11 per 1,000.

The causes of invaliding were 4 for secondary syphilis, 3 for tubercle of lung, and 1 each for delusional insanity, conjunctivitis, perforation of membrana tympani, valvular disease of heart, varix, and abscess.

There were 6 men discharged during the year as medically unfit for further service, the equivalent ratio being 10·60 per 1,000, which is exactly one half less than the rate for the preceding year, and is lower than the decennial average rate by 4·69. The causes of invaliding were tubercle of lung, 2 cases, and delusional insanity, deafness, varix and fracture, 1 case each.

OFFICERS.—The average strength of officers was 50, and there were 30 cases of sickness, giving a ratio of 600·0 per 1,000, being a decrease of 315·3 as compared with the previous year. Among the cases treated were 8 cases of remittent fever, 7 of digestive disorders, 4 of local injuries, and 1 case each of enteric fever and measles. The case of enteric fever was attributed to the drinking of impure water. An officer died at Port Royal from remittent fever. Five officers were invalided, 1 each for enteric fever, remittent fever, rheumatism, debility, and indigestion.

WOMEN.—In an average strength of 52 there were 45 cases of sickness, equal to a ratio of 865·4 per 1,000, which is lower than the ratio for 1899 by 228·9. The principal causes of sickness were debility 29 cases, remittent fever 6, diseases peculiar to women 4, and anæmia 2 cases.

CHILDREN.—The average strength was 119, with 46 cases of sickness, giving a ratio of 386·6 per 1,000, which shows a decrease as compared with the previous year of 283·0. The cases included 9 cases of measles, 8 of remittent fever, 5 of digestive disorders, 4 each debility, influenza, and bronchitis, and 2 cases each of dysentery, eczema, and local injuries. There were 2 deaths, viz., from tubercle of intestines and eclampsia.

VACCINATION.—There was 1 re-vaccination among the men and 1 among the women; the first resulted in failure, while the second gave a perfect result. Of 12 primary vaccinations among the children, only 1 resulted in failure.

II.—Non-European Troops.

Jamaica.

The average strength of non-commissioned officers and men, exclusive of European sergeants, was 1,092, and comprised the Jamaica Company Royal Artillery, the West India Submarine Mining Company Royal Engineers, the West India Fortress Company Royal Engineers, the 2nd Battalion West India Regiment, Depôt West India Regiment, and Staff and Departments. These were distributed at Up Park Camp 929, Port Royal 156, and Newcastle 7.

The following table shows the admission, mortality and invaliding rates, &c., among the non-European non-commissioned officers and men :—

1900. Average Strength.	Admissions.	Deaths.			Invalids.		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
1,092	1,467	7	—	7	—	75	94·52	1,343·4	6·41	—	68·68	86·56

In comparison with the preceding year, the ratio of admission has decreased by 442·7, that of mortality by 13·92, and the ratio of constantly sick by 20·43; and in comparison with the average decennial period, the admission and constantly sick ratios show an increase of 151·5 and 9·01 respectively, while the death-rate shows a decrease of 6·93. The average sick time to each soldier was 31·59 days, showing a decrease as compared with the previous year of 7·46 days, but an increase of 3·29 days in comparison with the decennial period, while the average duration of each case of sickness, 23·52 days, is longer by 1·66 days and shorter by ·23 of a day in similar comparisons.

The principal statistics of sickness and mortality arranged according to the various sections of disease are shown in Abstract X.

General Diseases.—There was 26 admissions under the heading of *eruptive fevers*, comprising 1 case of cow-pox and 25 of measles, all of which occurred at Up Park Camp. The disease was epidemic among the civil population during the early part of the year. All the cases were mild. In the previous year there was no admission for *eruptive fevers*, and the ratio for the year under report, 23·8 per 1,000, is higher than the ratio for the preceding ten years by 11·3 per 1,000.

Influenza caused 63 admissions, or a ratio of 57·7 per 1,000, as compared with *nil* in the preceding year, and 10·6, the average rate.

Under *enteric fever* are shown 6 admissions, with 1 death: The admission ratio, 5·5 per 1,000, is higher than the ratio in 1899 and than the average rate by ·7 and 1·3 respectively, while the mortality rate is lower in both these comparisons by 2·95 and 4·43 respectively. All the cases occurred at Up Park Camp, and are attributed by the Senior Medical Officer to the drinking of contaminated water outside barracks.

Other continued fevers gave 9 admissions, or a ratio of 8·2 per 1,000, being below the rate in the previous year by 18·9 per 1,000, and the average rate by 81·7.

Dysentery was the cause of 13 admissions, equal to a ratio of 11·9 per 1,000, which compared with the previous year's and with the decennial rates shows a decrease of 21·0 and 16·7 respectively.

Malarial fevers were the origin of 404 admissions, equal to a ratio of 370·0 per 1,000, which is lower than in the previous year by 237·9 per 1,000, but higher than the average for the preceding ten years by 216·5. One case is recorded as ague, the remainder being returned as remittent fever, which was also accountable for 3 deaths.

Jamaica.

Tubercular Diseases gave 7 admissions, and the admission rate, 6·4, shows a decrease of 5·2 as compared with the preceding year's ratio, and of 8·4 as compared with the decennial average rate. 4 of the cases are recorded as tubercle of the lungs.

Venereal Diseases.—The admissions for *primary syphilis* numbered 189, equal to a ratio of 173·1 per 1,000, which is higher than the corresponding rate in the previous year by 55·0, and than the decennial average rate by 16·2. No cases of soft chancre were recorded during the year.

For *secondary syphilis* there were 31 admissions, giving a ratio of 28·4 per 1,000, which, is higher than the rate in the previous year by 5·2, but lower than the decennial average rate by 13·3. *Gonorrhœa* was represented by 213 admissions, equivalent to a ratio of 195·1 per 1,000, which is higher than the rate for 1891 by 5·4, and than the average by 38·0.

Including all forms of venereal disease, the total admission rate in Jamaica was 396·6, showing an increase of 65·6, as compared with the ratio for the previous year, and of 40·9 as compared with the average rate. The ratio for constant inefficiency for these diseases was 38·81 per 1,000, which is higher than the rate in the preceding year, and the decennial average rate, by 10·79 and 8·52 respectively.

Parasitic Diseases, with 55 admissions, gave a ratio of 50·4 per 1,000, showing an increase as compared with the previous year's and average rates of 43·6 and 11·0 respectively. Of the total admissions 41 were due to ringworm and 11 to scabies.

Alcoholism caused 1 admission, a fatal case, at Up Park Camp.

Rheumatism gave 24 admissions, or a ratio of 22·0 per 1,000, showing a decrease on the previous year's rate and on that of the average of 53·5 and 19·5 respectively.

Debility gave 14 admissions, equal to a ratio of 12·8, as compared with 13·6 in the previous year, and 8·5 the decennial average rate.

For *other general diseases* there were 6 admissions, giving a ratio of 5·5 per 1,000, as compared with 109·4, the rate in the preceding year, and 17·8 the average rate. The admissions included 2 cases each of yaws, non-malignant new growth, and effects of the presence of foreign bodies.

Local Diseases.—*Diseases of the Nervous System*, with 3 admissions, gave a ratio of 2·7 per 1,000, showing a decrease on the previous year's and the decennial average rates of 11·8 and 7·3 respectively. The admissions comprised 1 case each of neuralgia, headache and melancholia.

Diseases of the Eye caused 24 admissions, the ratio per 1,000 being 22·0, which is less than the previous year's rate by 6·1, and than that of the decennial average by 3·2. Conjunctivitis was the cause of 21 of the admissions. *Diseases of Other Organs of Special Sense* gave 7 admissions, or a ratio of 6·4 per 1,000, which is below the rate in the preceding year by 8·1, and than the decennial average rate by 3·0. All the admissions were cases of aural affection.

Diseases of the Circulatory System.—Under this head there were 17 admissions, giving a ratio of 15·6 per 1,000. In comparison with the rate for the previous year and that for the decennial average there is a decrease of 67·7 on the former, and 6·1 on the latter. The admissions include 11 cases of disordered action and 6 of valvular disease of the heart.

Diseases of the Respiratory System furnished 59 admissions, giving a ratio of 54·0 per 1,000, which shows an increase, as compared with the ratio for 1899, of 8·5, and, with the average rate, of 1·2. The chief causes of admission were bronchial affections, pneumonia and pleurisy. There was one death from pneumonia.

Diseases of the Digestive System contributed 90 of the admissions, equivalent to a ratio of 82·4 per 1,000, which is less by 52·2 than the ratio for the previous year, but in excess of the average rate by 10·8. The principal causes of admission were affections of the mouth and throat, diarrhœa, dyspepsia, hepatic affections, and colic.

Diseases of the Lymphatic System gave a ratio of 22·0 per 1,000, caused by 24 admissions, and is lower than the ratio in the preceding year by 9·0, and than the decennial average rate by 14·4. Twenty-three of the cases were for inflammation, and 1 for suppuration of the lymphatic glands.

Diseases of the Urinary System were unrepresented.

Diseases of the Generative System with 9 admissions gave a ratio of 8·2 per 1,000, which is lower than the previous year's rate, and than the decennial ratio by 24·7 and 32·7 respectively. The cases comprised 6 of orchitis, 2 of urethral stricture, and 1 of phimosis.

Diseases of the Organs of Locomotion gave 7 admissions, or a ratio of 6.4 per 1,000, showing a decrease of 3·3 as compared with the rate in the previous year, and of ·8 in comparison with the average rate. Synovitis caused 4 of the admissions, and ostitis 2, the remaining case being recorded as bunion.

Diseases of the Connective Tissue caused 32 admissions, equal to a ratio of 29·3 per 1,000, as compared with 32·0, the ratio in 1899, and 30·9, the decennial average rate. The admissions were equally distributed between inflammation and abscess of the connective tissue.

For *diseases of the skin* there were 54 admissions, comprising 24 cases of boils, 12 of whitlow, 7 of ulcer, 6 of eczema, and 1 case each of impetigo, herpes, cicatrices, onychia, and wen. The ratio per 1,000 was 49·5, which is higher than the previous year's rate and that of the decennial average by 12·7 and 6·3 respectively.

INJURIES caused 79 admissions, equal to a ratio of 72·3 per 1,000, which is lower than the rate in the preceding year by 23·5, and than the average rate by 4·6. Under *general injuries* there was no admission, but one death is shown under the head of "suffocation from submersion" at Port Royal, while engaged in diving operations.

Under *local injuries*, 30 of the admissions were for wounds, 21 for abrasions, 14 for sprains, 7 for contusions, 3 each for fracture and dislocation, and 1 for burns and scalds.

SURGICAL OPERATIONS.—The only operation of any importance performed was that of excision of eyeball for conjunctivitis from gonorrhœa. Chloroform was the anæsthetic used.

INVALIDING.—The number of men discharged during the year as medically unfit was 75, being in the ratio of 68·68 per 1,000, which is lower than the corresponding rate in the previous year by 12·64, but higher than the decennial average rate by 20·98. The principal causes of invaliding were secondary syphilis 14 cases, remittent fever 11, rheumatism 9, debility 6, valvular disease of the heart 5, and 3 cases each of tubercle of lung, hernia, and ulcer.

WOMEN AND CHILDREN.—The average strength of the women was 63, with 20 admissions, and the ratio per 1,000, 317·5, which is an increase on the preceding year's rate of 150·8. The chief causes of admission were debility 4 cases, remittent fever and bronchitis 3 each, and influenza and dyspepsia 2 cases each. The average strength of the children was 64, and the admissions 23, being in a ratio of 359·4 per 1,000, which is a decrease on the previous year's rate of 89·6. Of the admissions 7 were for measles, 5 for bronchitis, 4 for remittent fever, and 2 for disorders of dentition.

VACCINATION.—Of 400 re-vaccinations amongst recruits with preserved lymph 213 were failures, and of 208 primary vaccinations 95 were failures, 6 re-vaccinations among children all resulted in failures, and of 22 primary vaccinations only 2 were returned as perfect. The numerous failures are attributed to deterioration of the lymph by heat and climate.

RECRUITING.—Of 2,022 recruits medically inspected, 1,495 were rejected as unfit.

The chief causes of rejection were:—Disease of heart 301, syphilis 200, under chest measurement 186, ulcers, wounds, and cicatrices 136, impaired constitution and debility 110, hernia 54, skin affections 53, under height 52, diseases of joints 38, tubercle 32, disease of veins 32, weakness of intellect 31, defective vision 25, loss or decay of many teeth 24, not likely to become an efficient soldier 23, and malformation of chest and spine 21.

Jamaica.

The average age, height, weight and chest measurement of the 527 foun fit were as follows :—

Age	20·39 years
Height	65·6 inches
Weight	127·7 lbs
Chest measurement ...	34·1 inches

Their state of education is as follows :—

Well educated	nil
Able to read and write ...	120
Able to read only ...	177
Unable to read	230

Sanitary Conditions.

The Senior Medical Officer (Lieut.-Colonel E. H. Joynt, M.D., R.A.M.C states that the health of the European troops during the year was good while with regard to the non-European troops he reports that the year wa upon the whole, a healthy one.

Up Park Camp.—Pasteur-Chamberland filters are used in barracks, an the water supply, which is obtained from the Hope River, is good an sufficient. The drainage is reported as satisfactory, the ablution and wast water being carried off by underground drainage, connected with th Kingston system, while surface drains carry the rainwater into a gull west of the camp. The dry-earth system of conservancy is in use, and ha worked well during the year. The site used for the deposit of night soil ha been changed to a piece of ground further away from the camp. At the statio hospital the drainage has been improved, and connected with the dee drainag esystem, and two w.c.'s have been built on the north-east verandal The drainage of the mortuary has been improved and a new table put in The want of special wards is again noted. An operating room is also note as being required.

Newcastle.—The water supply, which is good and sufficient, is obtaine from mountain springs, and is free from all sources of pollution. Th streams in the vicinity of Newcastle, however, are liable to pollution, an most of the cases of enteric fever which occurred during the year have bee traced to drinking impure water from these streams. The storm drains ar reported as being too shallow, allowing water to overflow, and thus causin injury to the roads. Two new huts have been erected, and the barrac accommodation is noted as being sufficient. The lighting of the vicinity o the camp and in the camp itself was again brought to notice. The lamp are noted as being of an old pattern. Wards for officers and prisoners ar to be added to the station hospital. New latrines and urinals to replace th old ones, and hot and cold water baths will also be erected. The cementin of the walls with Parian cement, and the extension of the partition wall to the ceiling, has been recommended.

Port Royal.—The barrack accommodation is still reported as insufficient During the year troops had to be sent to Greenwich Ridge and also pu under canvas to prevent overcrowding. Six new married quarters hav been occupied ; the partition walls, which are built of brick, are referred t as being a great improvement. The water supply is obtained direct fro Rock Spring by pipes, the old steam water tank boats being done awa with, except in one instance. A new bath is noted as being required in th ablution room for European troops, and a bath is to be provided for the u of the non-European troops. During the year Port Royal was constituted separate parish by Act of the Jamaica Legislature. The parochial board t control the sanitary condition of the town now consists of three officia members (two being naval and one military) and two civil members, the senio naval officer being chairman, and as a result of these changes it is hope that the native town will be kept in a better sanitary state than formerly

IX.—ON THE HEALTH OF THE TROOPS SERVING IN WESTERN AFRICA.

Sickness and Mortality.

I.—European Troops.

Western Africa.

The European troops consisted of the officers serving in the Command, the non-commissioned officers and men of the Royal Garrison Artillery and the Royal Engineers, the European non-commissioned officers of the Sierra Leone Fortress Company, Royal Engineers, West India and West African Regiments, and detachments of the Army Ordnance Corps, and Army Pay Corps.

The following table shows the admission, mortality, and invaliding rates among these troops :—

1900. Average Strength.	Admissions.	Deaths.			Invalids.		Average constantly sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged		Admissions.	Deaths.	Invalids sent Home.	Invalids finally discharged.	Constantly Sick.
78	161	—	—	—	19	—	6·92	2,064·1	—	243·59	—	88·72

The admission and constantly sick rates are lower than in 1899 by 382·0 and 10·51 per 1,000, and than the average rates for the ten years 1890–99 by 608·5 and 4·69 per 1,000 respectively. No deaths occurred in the Command during the year. The average sick time to each soldier was 32·38 days, which is shorter than in the previous year and than the average for the preceding ten years by 3·84 and 1·71 days respectively. The average duration of each case of sickness, 15·68 days, is longer than in 1899 by ·87 of a day and than the average period by 2·92 days.

In Abstract XI is a table showing the principal statistics of sickness and mortality arranged according to the various sections of disease.

General Diseases.—*Malarial fevers*, as in the previous year, furnished the largest number of admissions, viz., 111. Of these, 109 were for remittent fever, and the remaining 2 were cases of ague. The ratio per 1,000 equalled 1,423·1, which is less than the previous year by 223·1 and than the average of the three preceding years by 416·9. The average number constantly sick was equal to a ratio of 50·77 per 1,000, and shows an increase of 4·92 in comparison with the ratio of the previous year, but a decrease of 4·89 as compared with the average rate of the three preceding years. Including 1 admission for soft chancre, there were 13 admissions for *venereal diseases*, or a ratio of 166·6 per 1,000, being lower than in the previous year by 48·8 and than the average rate for the three preceding

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years by 33·4.* *Alcoholism* caused 4 admissions, 1 case being returned as delirium tremens. *Rheumatism* furnished 3 admissions, and *debility* 8.

Local Diseases.—Under *diseases of the nervous system* there was 1 admission, a case of mania. *Diseases of the digestive system* gave 9 admissions, or a ratio of 115·3 per 1,000, which is less than that for 1899 by 100·1, and than the three years' average rate by 27·6. The admissions comprised 3 cases of affections of the mouth and throat, 3 of diarrhœa, and 1 case each of dyspepsia, piles, and inflammation of liver. *Diseases of the lymphatic system* contributed 5 admissions, equal to a ratio of 64·1 per 1,000. *Urinary diseases* were represented by a single admission for cystitis. The case of soft chancre referred to above was the only admission recorded under *diseases of the generative system*. *Skin diseases* caused 3 admissions, 2 being for boils and 1 for whitlow. Under *injuries* there were 2 cases of sprain and 1 of blisters of feet.

Invaliding.—The number of men invalided to the United Kingdom was 19, equal to a ratio of 243·59 per 1,000, which is lower than the rate in the previous year and the decennial average ratio by 17·95 and 15·26 per 1,000 respectively. The diseases necessitating invaliding were remittent fever 11, debility 4, and one each for rheumatism, mania, suppuration of lymphatic glands, and wound of throat. No men were discharged during the year as medically unfit for further service.

Officers.—In an average strength of 36, there were 70 admissions, of which 53 were for malarial fevers, and 7 for digestive disorders. The admission ratio, 1,944·4 per 1,000, shows a decrease as compared with 1899, of 271·3 per 1,000. Malarial fevers furnished a ratio of 1,472·2 per 1,000, which is higher than the rate in the preceding year by 99·7 There was no death, but 9 officers were invalided, 7 on account of remittent fever, and 1 each for debility and piles.

II.—Non-European Troops.

The average strength of non-commissioned officers and men was 1,506. The non-European troops serving on the West Coast throughout the year consisted of the Sierra Leone Company, Royal Garrison Artillery, the Sierra Leone Fortress Company, Royal Engineers, the 3rd Battalion West India Regiment, and the West African Regiment.

The admission, mortality and invaliding rates, &c., are given in the following table :—

1900. Average Strength.	Admissions.	Deaths.			Invalids.		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent to West Indies.	Finally Discharged.		Admissions	Deaths.	Invalids sent to West Indies.	Invalids finally Discharged.	Constantly sick.
1,505	2,944	12	—	12	47	27	111·72	1,954·8	7·97	31·21	17·93	74·18

In comparison with the ratio for the preceding year and with the decennial average rate, the admission rate has increased by 310·4 and 165·1 respectively, while the death and constantly sick ratios have decreased by 10·44 and 6·66 as compared with the previous year, and by 10·54 and 9·62 in comparison with the decennial average ratio. The average sick time to each soldier was 27·08 days, which is shorter than in 1899 by 2·43, and than the average

* There were no admissions for ulcer of penis of non-venereal origin.

period for the preceding ten years by 3·51 days. The average duration of each case of sickness, 13·85 days, is shorter than in the previous year and than the average period by 4·09 and 3·24 days respectively. *Western Africa.*

The principal statistics of sickness and mortality arranged according to the various sections of disease are shown in Abstract XI.

GENERAL DISEASES.—*Eruptive fevers* were represented by 13 cases of chicken-pox and 3 of cow-pox. A fatal case of enteric fever occurred in the Panguma district. *Other continued fevers* gave 2 admissions. For *dysentery* there were 17 admissions, the ratio of prevalence being 11·3 per 1,000, which is higher than that for the previous year by 6·2 and than the average rate by 3·2.

Malarial Fevers caused 1,188 admissions, or a ratio of 788·9 per 1,000, which is higher than the previous year's rate by 60·6 but lower than the ten years' average rate by 144·5 per 1,000. The average number constantly sick from these fevers equalled a ratio of 27·46 per 1,000, as compared with 25·72 in 1899 and 28·42, the decennial average rate. Of the total number of cases 1,169 were for remittent fever and 19 for ague. There were 5 deaths, all of which were due to remittent fever.

For *septic diseases* there was a single admission, a case of erysipelas, which resulted fatally.

Tubercular Diseases caused 5 admissions and 2 deaths, equal to ratios of 3·3 and 1·33 per 1,000, which are lower than those for 1899 by 11·9 and 3·75, and than the average ratios for the ten years 1890–99 by 9·4 and 3·57 respectively. Of the admissions 4 were for tubercle of the lung, and both the deaths were due to this cause.

Venereal Diseases.—*Primary syphilis* caused 113 admissions, equal to a ratio of 75·0 per 1,000, or an increase of 28·0 on the previous year's rate. If to this be added the sickness from soft chancre, for which there were 65 admissions and 5·33 men constantly sick, the total admission ratio for primary venereal sores equalled 118·2 per 1,000, as compared with 108·6 per 1,000 in the previous year and 97·9, the average rate. *Secondary syphilis*, with 83 admissions, gave a ratio of 55·1 per 1,000, which is higher than the previous year's rate by 15·1, and than the average rate by 4·5. *Gonorrhœa* was the cause of 246 admissions, furnishing a ratio of 163·4 per 1,000, which shows an increase of 52·3 on the previous year, and of 51·5 on the average rate. Including all forms, the total admission ratio for venereal diseases was 336·7 per 1,000, which is higher than the rate in the previous year and than the decennial average rate by 77·0 and 76·3 respectively. The total amount of constant inefficiency on account of these diseases was equal to 21·33 per 1,000, which is higher than in the previous year by 3·52, and than the decennial average rate by 1·69.

Parasitic diseases were the cause of 75 admissions, which included 39 cases of scabies, 34 of ringworm, and 2 of tænia solium. The ratio, 49·8 per 1,000, exceeds that of the previous year and the decennial average rate by 3·5 and 11·6 respectively.

Rheumatism caused 74 admissions, giving a ratio of 49·1 per 1,000, which is higher than the previous year's rate by 1·5, but lower than the decennial average rate by 20·5. There was no case of rheumatic fever.

Debility.—Under this head are shown 17 admissions, giving a ratio of 11·3 per 1,000, which is lower than the rate in 1899, and the decennial average ratio by 3·3 and 1·1 respectively.

For *other general diseases* there were only 4 admissions, comprising 2 cases of non-malignant new growth, and one each of beri-beri and yaws. The case of beri-beri ended fatally.

LOCAL DISEASES.—*Diseases of the nervous system* were the cause of 9 admissions, equal to a of ratio 6·0 per 1,000, which is lower than the rate in the preceding year and than the decennial average rate by 1·0 and 3·5 respectively. The cases included 3 of neuralgia, 2 of epilepsy, and one each of mania, degeneration of spinal cord, paralysis and eclampsia.

Diseases of the Eye.—There were 40 admissions, giving a ratio of 26·6 per 1,000, showing a decrease as compared with the rate in 1899 of ·7,

Western Africa.

but an increase in comparison with the decennial average rate of 8·1. The majority of the cases (32) were for conjunctivitis.

Diseases of other Organs of Special Sense were represented by 2 admissions, both for aural disease.

Diseases of the Circulatory System caused 18 admissions, equal to a ratio of 11·9 per 1,000, which is lower than the previous year's ratio and than the decennial average rate by 2·7 and 4·3 respectively. The principal affections were 8 of disordered action and 7 of valvular disease of the heart.

Diseases of the Respiratory System.—There were 152 admissions recorded under this head, with 1 death. The admission rate, 100·9 per 1,000, is above that in 1899 by 31·7 and that of the average by 45·1. The principal causes of admission were bronchial affections, pneumonia, and asthma. The death was due to laryngitis.

Diseases of the Digestive System.—The admissions were 114 in number, equal to a ratio of 75·7 per 1,000, which is higher than in 1898 by 29·4, and than the average for the preceding ten years by 16·8. Among the cases treated were affections of the mouth and throat 56, diarrhœa 36, hernia 7, and dyspepsia 6. There was one death, due to diarrhœa.

Diseases of the Lymphatic System caused 96 admissions, or a ratio of 63·7 per 1,000, exceeding the previous year's rate and that of the decennial average by 26·2 and 29·9 respectively.

Diseases of the Urinary System were represented by 1 case of Bright's disease and 1 of cystitis. The admission ratio, 1·3 per 1,000, is below the previous year's rate by ·6 and that for the average period by 2·0.

Diseases of the Generative System with 111 admissions, or a ratio per 1,000 of 73·7, show a decrease in comparison with the previous year's rate and that of the decennial average of 6·3 and 3·9 respectively. The admissions comprised 65 cases of soft chancre, which have been already referred to under the heading of venereal diseases, 26 for inflammation of the testicle, 10 for ulcer of penis, 5 for phimosis, 2 for hydrocele, 2 for varicocele, and 1 for stricture of urethra.

Diseases of the Organs of Locomotion with 39 admissions, equal to a ratio of 25·9 per 1,000, show an increase of 8·8 and 14·1 respectively, in comparison with the rate in the previous year and the decennial average rate. Of the admissions 22 were for synovitis, 6 for flat feet, and 5 for periostitis.

Diseases of the Connective Tissue were the cause of 85 admissions, equal to a ratio of 56·4 per 1,000, which is practically the same as in the preceding year, but higher than the decennial average rate by 17·6; 58 of the admissions were for inflammation, and 27 for abscess of the connective tissue.

For *diseases of the skin* there were 287 admissions, giving a ratio of 190·6 per 1,000, which exceeds the previous year's rate by 58·5 and that of the decennial average by 98·6. Ulcers caused 198 of the admissions, boils 41, eczema 12, whitlows 11, and frostbite 9.

Injuries.—There were 145 admissions for local injury, the equivalent ratio being 96·3 per 1,000, which is higher than the rates for 1899 and the decennial average period by 30·9 and 30·5 respectively. The admissions included 55 for wounds, 33 for contusions, 21 for sprains, 16 for blisters of feet, 9 for fracture, and 7 for abrasions. There was no death.

Surgical Operations included excision of eyeball in a case of gonorrhœal iritis and an operation for phimosis. Both were performed under chloroform.

Invaliding.—The number of men sent to the West Indies was 47, equal to a ratio of 31·21 per 1,000, which is lower by 18·31 than that for 1899, and than that for the average period by 22·12. The chief causes necessitating invaliding were remittent fever, for which there were 17 cases, debility 9 cases, secondary syphilis 7 cases, bronchial affections 4, and tubercle of lung 3 cases. The number of men finally discharged the service was 27, including 3 who were discharged in Sierra Leone. The ratio, 17·93 per 1,000, is less than in the previous year, and than the average rate by 11·27 and 9·29 respectively. The principal causes of discharge were tubercular diseases, debility, valvular disease of heart, and bronchial affections, 3 cases

each, and remittent fever, secondary syphilis and disordered action of heart, 2 cases each. *Western Africa.*

WOMEN AND CHILDREN.—The average strength of the women was 28, with 92 admissions, equivalent to a ratio of 3,285·7 per 1,000, which is higher than in 1899 by 960·7. Among the cases were 55 of remittent fever, 11 debility, 4 bronchitis, and 4 for diseases peculiar to women. Three deaths occurred, viz. :—One each from remittent fever and non-malignant new growth, and post-partum hæmorrhage. The average strength of the children was 29, among whom there were 55 admissions and 3 deaths. The admission ratio, 1,896·5 per 1,000, is higher than in the previous year by 729·9, while the mortality rate 103·45 per 1,000, is lower by 63·21. The admissions included 24 cases of remittent fever, 11 of bronchial affections, and 9 of digestive disorders. Two of the deaths were due to bronchitis and 1 to diarrhœa.

VACCINATION.—All vaccinations were performed with lymph supplied by the Army Vaccine Institute, Aldershot. Of 83 operations for re-vaccinations among soldiers 66 were failures. There were no vaccinations amongst women, and of 11 primary vaccinations among children 9 were failures.

SANITARY CONDITIONS.

The Senior Medical Officer (Major R. G. Thompson, R.A.M.C.) reports that the barrack accommodation is ample for the approved strength of the garrison, but when detachments of the West India Regiment are moved to Sierra Leone the accommodation is not sufficient. Quarters for the full strength of medical officers are recommended; at present the quarters are insufficient, only the Senior Medical Officer being quartered near the barracks and troops. The hospital accommodation is again noted as being inadequate, but additional accommodation at Tower Hill and new hospitals at Mount Vernon and Wilberforce have been sanctioned. A washhouse and bathroom are noted as being required for the European sick in the new permanent building, and a new kitchen and waiting-room for morning sick are needed at Tower Hill Hospital. There were also some minor sanitary improvements carried out during the year, which do not require any special notice. The water supply is from hill springs, and is said to be excellent, no purification being necessary. The drainage, which is altogether surface, is efficient, and the dry earth system of latrines, which is used, is noted as being good.

The huts used by non-European soldiers at Wilberforce have been roofed with corrugated iron instead of thatch, which is a great improvement, as the old roofs leaked badly. At Mount Auriol, Kortright Hill, and Wilberforce the bush has been cleared all round the barracks, giving freer ventilation, rendering the huts less damp in the rainy season, and preventing the deposit of insanitary rubbish in the neighbourhood.

XI.—ON THE HEALTH OF THE TROOPS SERVING IN THE ISLAND OF MAURITIUS.

Sickness and Mortality.

Mauritius.

I.—European Troops.

The average strength of warrant officers, non-commissioned officers and men serving in the Command during the year was 463. The garrison throughout the year consisted of Nos. 8 and 26 Companies, Western Division, Royal Garrison Artillery, No. 43 and Mauritius Submarine Mining Companies Royal Engineers, and detachments of the 2nd Battalion King's Own Yorkshire Light Infantry, Army Service, Royal Army Medical and Army Ordnance Corps, and Garrison Staff.

The admission, mortality and invaliding rates, &c., among the troops forming the garrison are shown in the following table :—

1900. Average Strength	Admissions.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Sent Home.	Invalids. Finally Discharged.	Average constantly Sick.	Ratio per 1,000 of Strength. Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
463	349	3	—	3	9	3	26·05	753·8	6·48	19·44	6·48	56·26

The admission rate is lower than in 1899 by 283·4, the death rate by 1·93 and the constantly sick rate by 4·20 per 1,000. In comparison with similar average ratios for the preceding ten years, the admission rate has declined by 531·3, the death rate by 6·99, and the constantly sick rate by 16·12 per 1,000.

The average sick time to each soldier was 20·54 days, which is shorter than in 1899 by 1·53 days, and than the average for the ten years 1890–99 by 5·88 days. The average duration of each case of sickness was 27·24 days, which is longer than in the previous year by 5·97 days, and than the average period by 6·68 days.

In Abstract XXIX is a table showing these health statistics for the several corps which served in the Command during the year.

In the Royal Artillery, the admission and constantly sick rates were 840·7 and 60·54 per 1,000, as compared with 1,200·0 and 74·85 respectively in the previous year. In the Royal Engineers these rates were 616·3 and 41·28, while in the Infantry they were 750·0 and 69·46 per 1,000. All the deaths occurred in the Royal Artillery, the ratio being 10·17 per 1,000, as compared with 13·56 in the previous year.

With regard to the influence of age on sickness and mortality, it is calculated that among men under 20 years of age, with an average strength of 18, that the admission rate was 277·8 per 1,000, among men between 2)

and 25 years, 942·0, among those between 25 and 30, 766·5, among men between 30 and 35 years of age, 295·5, and among men over 35 years of age, average strength of 27, 296·3 per 1,000. In the previous year the admission rate for the corresponding age periods were 758·6, 1,428·2, 814·9, 565·2 and 280·0 per 1,000 respectively. All the deaths occurred among men between 25 and 30 years of age, equivalent to a ratio of 17·96 per 1,000. *Mauritius.*

With regard to service in the Command the admission ratio for men in their first year was 1,920·0 per 1,000, among men in their second year 820·5, among men in their third year 440·6, and among men who had been more than three years in the Command, average strength 16, the ratio was 250·0 per 1,000. The corresponding rates of admission in the previous year were 777·1, 1,425·9, 1,306·8 and *nil*. Of the deaths, 2, or a ratio of 10·26 per 1,000, occurred in men in their second year, and 1, or 4·93 per 1,000, occurred among men in their third year of service.

In Abstract XIV is a table showing the principal statistics of sickness and mortality, arranged according to the various sections of disease.

GENERAL DISEASES.—Only one admission, a case of measles, is shown under the heading of *other eruptive fevers*, compared with two admissions (both for rubella) in the previous year.

Enteric Fever was the cause of 12 admissions and 2 deaths, equal to ratios of 25·9 and 4·32 per 1,000 respectively. These rates are higher than in the previous year by 10·3 and ·71 per 1,000 respectively, and in comparison with the decennial average rates the admission rate is higher by 9·5, and that of mortality lower by 1·19 per 1,000. The percentage of mortality to attack was 16·7, as compared with 23·1 in 1899, and with 33·6, the average percentage for the ten preceding years. Of the cases 8 came from Curepipe and 4 from Port Louis; but 6 of the 8 cases admitted from Curepipe had recently arrived at that place from Port Louis. A man of the Royal Army Medical Corps was admitted from Curepipe, who, it is believed, contracted the disease while attending on other enteric cases, but none of the other cases were traced to any definite cause, although it is considered probable that the majority contracted the disease in Port Louis.

Other Continued Fevers were represented by a single admission for simple continued fever.

Dysentery caused 7 admissions, equal to a ratio of 15·1 per 1,000, which shows an increase of 10·3 on the previous year's rate, and of 5·0 on the decennial average rate.

Malarial Fevers with 96 admissions and 1 death, gave ratios of 207·4 and 2·16 per 1,000 respectively. The admission rate shows a decrease as compared with that for 1899 of 37·8, and in comparison with the decennial average rate of 303·0. There were 89 cases of ague and 7 of remittent fever, from which cause the death occurred. Nearly all of the cases came from Port Louis.

Venereal Diseases.—Primary syphilis caused 36 admissions, equal to a rate of 77·3 per 1,000, which is lower than the previous year's rate by 22·5. As there was no case of soft chancre in the year under report, a further decrease is shown in comparison with the ratio for primary venereal sores for 1899 of 55·0, and the decennial average rate is also lower by 2·7 per 1,000. *Secondary syphilis* furnished 11 admissions, or a ratio of 23·8 per 1,000, which is lower than the previous year's rate and that of the decennial average by 31·5 and 16·0 respectively. *Gonorrhœa*, with 40 admissions, gave a ratio of 86·4 per 1,000, which shows a decrease as compared with the previous year's rate of 18·2, and in comparison with the average of 21·5. Taking all these forms together, the total admission rate for venereal diseases amounts to 187·5 per 1,000, which is below the rate for 1899, and that for the decennial period, 1890–99, by 104·7 and 34·2 respectively. The total amount of constant inefficiency on account of these diseases was equal to 19·27 per 1,000, or a decrease on the previous year's rate of 4·47, and an increase on the decennial average rate of ·96.*

* There were no admissions for ulcer of penis of non-venereal origin.

Mauritius.

Parasitic Diseases.—Only 2 admissions are recorded, 1 for tænia solium and 1 for scabies. The ratio of admission, 4·3 per 1,000, shows a decrease compared with the ratio for 1899, and with the decennial average rate of 13·7 and 16·4 respectively.

Alcoholism.—A single admission is recorded under this head as compared with 5 in the previous year.

Rheumatism, gave 3 admissions, or a ratio of 6·5 per 1,000, which is below the previous year's rate and that of the decennial average by 12·7 and 10·8 respectively.

For *debility* there were 8 admissions, giving a ratio of 17·3 per 1,000, which shows an increase on the previous year's rate of 12·5, and on the average rate of 7·1.

Other General Diseases caused 2 admissions, both for non-malignant new growth, as compared with 8 admissions in the previous year.

LOCAL DISEASES.—*Diseases of the Nervous System* caused 5 admissions, equal to a ratio of 10·3 per 1,000 which is higher than the previous year's rate by 2·4, and fractionally above the decennial average ratio. The admissions included 2 cases of neuralgia and one case each of paralysis, torticollis, and mania.

For *Diseases of the Eye* there was only 1 admission, a case of conjunctivitis. For *other organs of special sense* there were 5 admissions comprising 3 for inflammation of the external meatus, and 2 for inflammation of the membrana tympani, the ratio, 10·8 per 1,000, being exactly similar to the previous year's rate, but below the average rate by 6·8.

Diseases of the Circulatory System caused only 1 admission compared with 10 in the previous year.

Diseases of the Respiratory System were the cause of 5 admissions, giving a ratio of 10·8 per 1,000, which shows a decrease as compared with the previous year's ratio and the average rate for the preceding ten years, of 8·4 and 16·4 per 1,000 respectively. Of the cases, 4 were for bronchial affections and 1 for phthisis.

Diseases of the Digestive System, with 19 admissions, gave a ratio of 41·1 per 1,000, which is below the rate for the previous year and that of the decennial average by 27·4 and 72·0 respectively. Affections of the mouth and throat caused 7 admissions, and there were 3 cases each of dyspepsia, diarrhœa, and hepatic disorders.

Diseases of the Lymphatic System caused 11 admissions, giving a ratio of 23·8 per 1,000, which is above the rate in the previous year by 10·6, but below the average rate for the preceding ten years by 9·6. Inflammation of the lymphatic glands was the sole cause of admission. There were no admissions for *diseases of the urinary system.*

Under *diseases of the generative system* 6 admissions are recorded, equal to a ratio of 13·0 per 1,000, which is lower than the previous year's and decennial average rates by 29·1 and 36·4 respectively. There were 4 admissions for orchitis, and 1 each for phimosis and paraphimosis. No admissions were recorded under *diseases of the organs of locomotion.*

Diseases of the Connective Tissue caused 7 admissions, or a ratio of 15·1 per 1,000, which shows a decrease in comparison with the ratio for 1899 and that of the decennial average of 30·6 and 8·2 respectively. Three of the admissions were for inflammation and 4 for abscess.

Diseases of the Skin caused 11 admissions, the equivalent ratio being 23·8 per 1,000, which is lower than the previous year's and average rates by 14·7 and 21·3 respectively. Boils, whitlows, eczema, ulcers and onychia were the causes of admission.

INJURIES.—55 admissions are recorded, equal to a ratio of 118·8 which is lower than the ratio for 1899 by 29·1, and than that for the decennial average by 1·5. Only 1 admission is shown under *general injuries*, a case of heat-stroke; while under *local injuries* the majority of the cases were for wounds and sprains.

SURGICAL OPERATIONS.—No major operations are recorded.

INVALIDING.—The number of men invalided home during the year was 9, giving a ratio of 19·44 per 1,000, which is above the rate for 1899 by 11·03, but below the decennial average rate by 28·62. Of the men invalided, 3, or 10·17 per 1,000, belonged to the Royal Artillery, 2, or 23·26 per 1,000, to the Royal Engineers, 3, or 53·57 per 1,000, to the Infantry, and 1, or 38·46 per 1,000, to Garrison Staff and Departments. With regard to age, 5 men, or 24·15 per 1,000, were between 20 and 25 years, 1, or 5·99 per 1,000, was between 25 and 30, 1, or 22·73 per 1,000, was between 30 and 35, and 2, or 74·07 per 1,000, were over 35 years of age. As regards service in the Command, 1 man, or 20·00 per 1,000, was in his first year, 7 men, or 35·90 per 1,000, were in their second year, and 1 man, or 4·93 per 1,000, was in his third year of service. The causes of invaliding were 4 cases of secondary syphilis, and 1 case each of rheumatism, debility, mania, disordered action of the heart, and phthisis. The number of men finally discharged as medically unfit was 3, equal to a ratio of 6·48 per 1,000, which is above the previous year's rate by 1·67, but below that of the decennial average by 6·38. The causes of discharge were 1 each for mania, disordered action of the heart and incontinence of urine.

OFFICERS.—In an average strength of 47 there were 16 cases of sickness, equal to a ratio of 340·4 per 1,000, which is lower than the previous year's rate by 121·8. There were 7 admissions for ague and 1 for remittent fever, 2 admissions for sprain and single cases of other diseases. There was no death, nor were any officers invalided during the year.

WOMEN.—The health of the women has been good. In an average strength of 43 there were 7 admissions and 1 death, giving ratios of 162·8 and 23·26 per 1,000. The admission rate shows a decline in comparison with the previous year's rate of 50·0. The causes of admission were debility, 3 cases, anæmia, 2, and pleurisy and inflammation of stomach, 1 case each. The case of pleurisy proved fatal.

CHILDREN.—The average strength was 65, and there were 18 admissions, with 3 deaths, equal to ratios of 276·9 and 46·15 respectively, being higher than the corresponding ratios in the previous year by 189·9 and 31·66.

Among the admissions were 7 cases of measles, 2 of diphtheria, 1 of enteric fever, 1 of dysentery, and 2 of enteritis. The deaths were due to dysentery, laryngitis, and enteritis.

VACCINATION.—There were 7 cases of primary vaccination amongst the children all but one resulting in failure, and of 2 cases of re-vaccination, one amongst men and one amongst women, both were failures. The lymph was obtained from the Mauritius Medical Health Department.

II.—NON-EUROPEAN TROOPS.

The non-European troops present throughout the year were two companies of the Ceylon-Mauritius Battalion, Royal Artillery, average strength 151, and the 1st Bengal Infantry, with an average strength of 804.

The garrison was increased by the arrival of the 27th Madras Infantry, from India in January, the average strength for the year being 716. The 2nd Battalion British Central African Rifles, who were quartered on the s.s. "Nerbudda" and Flat Island, embarked for Somaliland in February, the average annual strength being 120.

The total average strength therefore of the non-European troops was 1,792, and there were 1,670 admissions into hospital and 27 deaths, the equivalent ratios being 931·9 and 15·07 per 1,000, the former showing a decrease as compared with similar rates for 1899 to the extent of 1,016·9 per 1,000, while an increase of 1·72 is observed in the latter.

The distribution of all diseases among the Royal Artillery and Infantry, was equivalent to 1,245·0 admissions per 1,000 in the former, and 903·7 in the latter.

Parasitic Diseases.—Only 2 admissions are recorded, 1 for tænia solium and 1 for scabies. The ratio of admission, 4·3 per 1,000, shows a decrease compared with the ratio for 1899, and with the decennial average rate of 13·7 and 16·4 respectively.

Alcoholism.—A single admission is recorded under this head as compared with 5 in the previous year.

Rheumatism, gave 3 admissions, or a ratio of 6·5 per 1,000, which is below the previous year's rate and that of the decennial average by 12·7 and 10·8 respectively.

For *debility* there were 8 admissions, giving a ratio of 17·3 per 1,000, which shows an increase on the previous year's rate of 12·5, and on the average rate of 7·1.

Other General Diseases caused 2 admissions, both for non-malignant new growth, as compared with 8 admissions in the previous year.

LOCAL DISEASES.—*Diseases of the Nervous System* caused 5 admissions, equal to a ratio of 10·3 per 1,000 which is higher than the previous year's rate by 2·4, and fractionally above the decennial average ratio. The admissions included 2 cases of neuralgia and one case each of paralysis, torticollis, and mania.

For *Diseases of the Eye* there was only 1 admission, a case of conjunctivitis. For *other organs of special sense* there were 5 admissions comprising 3 for inflammation of the external meatus, and 2 for inflammation of the membrana tympani, the ratio, 10·8 per 1,000, being exactly similar to the previous year's rate, but below the average rate by 6·8.

Diseases of the Circulatory System caused only 1 admission compared with 10 in the previous year.

Diseases of the Respiratory System were the cause of 5 admissions, giving a ratio of 10·8 per 1,000, which shows a decrease as compared with the previous year's ratio and the average rate for the preceding ten years, of 8·4 and 16·4 per 1,000 respectively. Of the cases, 4 were for bronchial affections and 1 for phthisis.

Diseases of the Digestive System, with 19 admissions, gave a ratio of 41·1 per 1,000, which is below the rate for the previous year and that of the decennial average by 27·4 and 72·0 respectively. Affections of the mouth and throat caused 7 admissions, and there were 3 cases each of dyspepsia, diarrhœa, and hepatic disorders.

Diseases of the Lymphatic System caused 11 admissions, giving a ratio of 23·8 per 1,000, which is above the rate in the previous year by 10·6, but below the average rate for the preceding ten years by 9·6. Inflammation of the lymphatic glands was the sole cause of admission. There were no admissions for *diseases of the urinary system.*

Under *diseases of the generative system* 6 admissions are recorded, equal to a ratio of 13·0 per 1,000, which is lower than the previous year's and decennial average rates by 29·1 and 36·4 respectively. There were 4 admissions for orchitis, and 1 each for phimosis and paraphimosis. No admissions were recorded under *diseases of the organs of locomotion.*

Diseases of the Connective Tissue caused 7 admissions, or a ratio of 15·1 per 1,000, which shows a decrease in comparison with the ratio for 1899 and that of the decennial average of 30·6 and 8·2 respectively. Three of the admissions were for inflammation and 4 for abscess.

Diseases of the Skin caused 11 admissions, the equivalent ratio being 23·8 per 1,000, which is lower than the previous year's and average rates by 14·7 and 21·3 respectively. Boils, whitlows, eczema, ulcers and onychia were the causes of admission.

INJURIES.—55 admissions are recorded, equal to a ratio of 118·8 which is lower than the ratio for 1899 by 29·1, and than that for the decennial average by 1·5. Only 1 admission is shown under *general injuries*, a case of heat-stroke; while under *local injuries* the majority of the cases were for wounds and sprains.

SURGICAL OPERATIONS.—No major operations are recorded.

INVALIDING.—The number of men invalided home during the year was 9, giving a ratio of 19·44 per 1,000, which is above the rate for 1899 by 11·03, but below the decennial average rate by 28·62. Of the men invalided, 3, or 10·17 per 1,000, belonged to the Royal Artillery, 2, or 23·26 per 1,000, to the Royal Engineers, 3, or 53·57 per 1,000, to the Infantry, and 1, or 38·46 per 1,000, to Garrison Staff and Departments. With regard to age, 5 men, or 24·15 per 1,000, were between 20 and 25 years, 1, or 5·99 per 1,000, was between 25 and 30, 1, or 22·73 per 1,000, was between 30 and 35, and 2, or 74·07 per 1,000, were over 35 years of age. As regards service in the Command, 1 man, or 20·00 per 1,000, was in his first year, 7 men, or 35·90 per 1,000, were in their second year, and 1 man, or 4·93 per 1,000, was in his third year of service. The causes of invaliding were 4 cases of secondary syphilis, and 1 case each of rheumatism, debility, mania, disordered action of the heart, and phthisis. The number of men finally discharged as medically unfit was 3, equal to a ratio of 6·48 per 1,000, which is above the previous year's rate by 1·67, but below that of the decennial average by 6·38. The causes of discharge were 1 each for mania, disordered action of the heart and incontinence of urine.

OFFICERS.—In an average strength of 47 there were 16 cases of sickness, equal to a ratio of 340·4 per 1,000, which is lower than the previous year's rate by 121·8. There were 7 admissions for ague and 1 for remittent fever, 2 admissions for sprain and single cases of other diseases. There was no death, nor were any officers invalided during the year.

WOMEN.—The health of the women has been good. In an average strength of 43 there were 7 admissions and 1 death, giving ratios of 162·8 and 23·26 per 1,000. The admission rate shows a decline in comparison with the previous year's rate of 59·0. The causes of admission were debility, 3 cases, anæmia, 2, and pleurisy and inflammation of stomach, 1 case each. The case of pleurisy proved fatal.

CHILDREN.—The average strength was 65, and there were 18 admissions, with 3 deaths, equal to ratios of 276·9 and 46·15 respectively, being higher than the corresponding ratios in the previous year by 189·9 and 31·66.

Among the admissions were 7 cases of measles, 2 of diphtheria, 1 of enteric fever, 1 of dysentery, and 2 of enteritis. The deaths were due to dysentery, laryngitis, and enteritis.

VACCINATION.—There were 7 cases of primary vaccination amongst the children all but one resulting in failure, and of 2 cases of re-vaccination, one amongst men and one amongst women, both were failures. The lymph was obtained from the Mauritius Medical Health Department.

II.—NON-EUROPEAN TROOPS.

The non-European troops present throughout the year were two companies of the Ceylon-Mauritius Battalion, Royal Artillery, average strength 151, and the 1st Bengal Infantry, with an average strength of 804.

The garrison was increased by the arrival of the 27th Madras Infantry, from India in January, the average strength for the year being 716. The 2nd Battalion British Central African Rifles, who were quartered on the s.s. "Nerbudda" and Flat Island, embarked for Somaliland in February, the average annual strength being 120.

The total average strength therefore of the non-European troops was 1,792, and there were 1,670 admissions into hospital and 27 deaths, the equivalent ratios being 931·9 and 15·07 per 1,000, the former showing a decrease as compared with similar rates for 1899 to the extent of 1,016·9 per 1,000, while an increase of 1·72 is observed in the latter.

The distribution of all diseases among the Royal Artillery and Infantry, was equivalent to 1,245·0 admissions per 1,000 in the former, and 903·7 in the latter.

XII.—ON THE HEALTH OF THE TROOPS SERVING IN THE ISLAND OF CEYLON.

Sickness and Mortality.

I.—European Troops.

Ceylon.

The average strength of warrant officers, non-commissioned officers and men was 1,030. The force serving throughout the year comprised Nos. 34 and 37 Companies, Southern Division, Royal Garrison Artillery, half the 41st (Fortress) Company, Royal Engineers, and detachments of the Royal Engineers, Army Service, Royal Army Medical, Army Ordnance and Army Pay Corps, and Garrison Staff.

The 2nd Battalion Highland Light Infantry left the Command for England in February, and the 2nd Battalion King's Royal Rifle Corps, which arrived from South Africa in August, left for India on the 31st of December. The 1st Battalion Gloucester Regiment arrived from South Africa in August, and the 1st Battalion Duke of Cornwall's Light Infantry arrived from India during the latter part of December; the increase of the infantry portion of the garrison being consequent upon a large number of Boer prisoners of war having been deported to Ceylon, for whom guards were necessary.

In accordance with the usual practice, the sanatorium at Newera Eliya was closed on the 31st May, 1899, owing to the advent of the rainy season, and was again occupied in September.

The following table shows the admission, mortality and invaliding rates, &c., among the troops in the Command:—

1900. Average Strength.	Admissions.	Deaths.			Invalids.		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
1,030	844	11	—	11	20	5	39·46	819·4	10·68	19·42	4·85	38·31

The admission and constantly sick rates are lower than in 1899 by 318·2 and 18·29, and than the average rate for the preceding ten years by 187·8 and 17·63 per 1,000 respectively, while the death rate is higher in both these comparisons by 2·08 and 1·81 respectively. The average sick time to each soldier was 13·98 days, which is shorter than in 1899 and than the decennial average period by 6·68 and 6·44 days respectively. The average duration of each case of sickness, 16·67 days, is shorter than in the previous year by 1·49 days and than the average period by 3·60 days.

In Abstract XXIX is a table showing these statistics for the various corps which served in Ceylon during the year, from which it will be seen that the admission rate for the Royal Artillery was 858·2, for the Royal Engineers 609·2, for the Infantry 866·4, and for other corps 256·4 per 1,000. Of the 11 deaths in the Command, 2 occurred in the Artillery, and 9 in the Infantry, the respective ratios being 7·46 and 14·15 per 1,000. The ratio

of constant inefficiency was 45·78 in the Artillery, 30·23 in the Engineers, 38·02 in the Infantry, and 9·74 per 1,000 among men of other corps. *Ceylon.*

As the necessary information for the completion of the quinquennial tables was not available, the ratios in periods of age cannot be given.

As to service in the Command, the admission rates were 904·4 among men in their first year, 766·2 among men in their second year, 619·1 among men in their third year, and 581·6 among men who had been more than three years in the Command. In the preceding year the highest ratio was among men in their first year, followed by that among men in their third year, next by men in their second year and least among men who had been more than three years in the Command. The deaths were 8, or 12·97 per 1,000, among men in their first year, 2 or 8·66 per 1,000, among men in their second year, and 1, or 10·20 per 1,000, among men with over three years' service in the Command. There was no death among men in their third year of service in the Command.

In Abstract XV is given a table showing the principal statistics of sickness and mortality arranged according to the various sections of disease.

GENERAL DISEASES.—*Eruptive Fevers.* There was no admission under this head during the year under report. In the preceding year there was one admission for rubella. *Influenza* caused 1 admission, or a ratio of 1·0 per 1,000, as compared with 8·6 in the previous year and 4·1, the decennial average rate. *Enteric fever* was the cause of 31 admissions and 5 deaths, the admission rate being 30·1, or an increase of 27·2 on that of 1899, and of 25·6 on the decennial average rate. The distribution of the cases were as follows:—

Station.	No. of Cases.	No. of Deaths.
Diyatalawa Camp	25	5
Colombo	5	—
Newera Eliya..	1	—
Total	31	5

The following table shows the number of admissions by months:—

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Admissions ...	1	—	—	1	—	—	4	1	—	2	11	11
Deaths	—	—	—	—	—	—	—	—	—	1	2	2

The Senior Medical Officer states that the cases at Diyatalawa Camp were "derived from the Boer prisoners of war incarcerated in an adjoining camp, and among whom enteric fever was prevailing in an epidemic form" (*see* Appendix IV). Of the 5 cases which occurred at Colombo, 3 originated at Mutwal Battery, and some suspicion attached to the water supply, which only passed through an ordinary chatty filter of charcoal and sand. The use of the chatty filter was discontinued and a small Pasteur filter substituted. No probable cause was discovered to account for the others. The remaining case occurred at the sanatorium, Newera Eliya, but the origin of the disease could not be definitely assigned, and it is remarked that this was the first case that has occurred there.

Ceylon.

Simple Continued Fever caused 59 admissions, equal to a ratio of 57·3 per 1,000, which is higher than that of the previous year by 46·6 and than the average rate for the preceding ten years by 18·0.

Dysentery was the cause of 9 admissions, being in the ratio of 8·7 per 1,000, which is practically identical with the ratio in 1899, but below the decennial average rate by 8·8 per 1,000.

Malarial Fevers numbered 62 admissions, giving a ratio of 60·2 per 1,000, as compared with 352·0 in the previous year and with 131·7, the decennial average rate. The Senior Medical Officer refers to the great decrease as compared with 1899, and notes that it is probably due to the regiment referred to in last year's report as having arrived from a malarious station in India having furnished fewer admissions, the plasmodium gradually disappearing as the stay of the regiment lengthened. He further adds that "malarial-bearing mosquitoes" are practically non-existent in the military stations of Ceylon. A death is returned under remittent fever.

Tubercular Diseases were represented by 4 admissions, equal to a ratio of 3·9 per 1,000, which is higher than the rate in the previous year and than the ten years' average rate by 1·0 and 0·3 per 1,000 respectively. All the cases were tubercle of lung, and a death occurred from this cause.

Venereal Diseases.—For *primary syphilis* there were 30 admissions, giving a ratio of 29·1 per 1,000, which is below that for the previous year by 24·7. If to this be added the sickness from soft chancre, for which there were 13 admissions, with 0·61 men constantly sick, the total admission ratio from primary venereal sores equalled 41·7 per 1,000, which is below the previous year's rate by 30·7 and is 73·4 less than the average for the preceding ten years. *Secondary syphilis*, with 13 admissions, gave a ratio of 12·6 per 1,000, which is below the previous year's rate by 19·6 and the decennial average rate by 42·6. *Gonorrhœa* caused 88 admissions, or a ratio of 85·4 per 1,000, being less than that of the previous year and the decennial average by 14·9 and 37·3 respectively. Taking all forms of venereal disease together, the total admission ratio was 139·7 per 1,000, which is lower than that of the preceding year by 65·2, and than the decennial average rate by 153·3. The ratio of constantly sick for these diseases was 8·67 per 1,000, as compared with 16·48 in 1899 and 22·29, the average rate.*

The following table shows the distribution of venereal disease in the several stations in the Command :—

Station.	Strength.	Admitted for					Ratio per 1,000.
		Primary Syphilis.	Soft Chancre.	Secondary Syphilis.	Gonorrhœa.	Total.	
Colombo	381	12	7	11	31	61	160·1
Kandy	71	6	4	—	16	26	366·2
Newera Eliya	22	—	—	1	—	1	45·5
Trincomali	228	4	2	—	16	22	96·5
Diyatalawa Camp ...	328	8	—	1	25	34	103·7
Total for Command	1,030	30	13	13	88	144	139·7

The general type of venereal disease is said to have been mild, and with reference to the ratio per 1,000 in the garrison at Kandy, the medical officer remarks that "Kandy cannot be held responsible for all this, as in many cases the disease was contracted in Colombo."

Parasitic Diseases.—This class of diseases gave 15 admissions, equal to a ratio of 14·6 per 1,000, which is lower than that of 1899 by 0·4 and is also fractionally below the average rate. The admissions were made up as follows :—12 cases of ringworm, 2 of scabies, and 3 of tænia solium.

* There were 21 admissions for ulcer of penis of non-venereal origin, with 1·48 men constantly sick. If, as in former years (prior to 1897), these cases were included with those of primary syphilis and soft chancre under the heading of primary venereal sores, the admission and constantly sick rates for all venereal diseases would equal 160·1 and 10·11 respectively.

Alcoholism caused 6 admissions, 1 being returned as delirum tremens, as against 7 in the preceding year. All the cases recovered satisfactorily. *Ceylon.*
There were 22 admissions for *rheumatism*, or an admission ratio of 21·4 per 1,000, which shows an increase as compared with the ratio in the preceding year of 3·5 and a similar increase in comparison with the average rate. There were two cases of rheumatic fever.

Debility gave 27 admissions, or a ratio of 26·2 per 1,000, which is higher than the previous year's rate by 1·8, but below the decennial average rate by 1·7.

Other General Diseases.—There were 5 admissions, comprising 3 cases of non-malignant new growth and 2 of anæmia.

LOCAL DISEASES.—*Diseases of the Nervous System*, with 9 admissions, gave a ratio of 8·7 per 1,000, which is higher than the previous year's rate and that of the decennial average by 3·7 and 1·6 respectively. The cases were 7 of neuralgia and 1 each of mania and melancholia.

Diseases of the Eye caused 17 admissions, equal to a ratio of 16·5 per 1,000, which is higher than the rates of the previous year and the decennial average by 5·0 and 3·0 respectively.

For *diseases of other organs of special sense*, there were 25 admissions, all for aural diseases. The ratio per 1,000, 24·3, is higher than the previous year's rate by 8·5 and than the decennial average rate by 9·1. Of the admissions, 24 were for inflammation of the external meatus and 1 for perforation of the membrana tympani.

Diseases of the Circulatory System caused 9 admissions, equal to a ratio of 8·7 per 1,000, as compared with 7·9 in the previous year and with 8·2, the decennial average ratio. There were 8 cases of disordered action, and 1 of valvular disease, of the heart.

Diseases of the Respiratory System.—There were 18 admissions, giving a ratio of 17·4 per 1,000, which shows a decrease of 3·4 as compared with the previous year's rate, and of 5·8 in comparison with the decennial average rate. There was one death, due to pneumonia.

Diseases of the Digestive System, with 84 admissions, gave a ratio per 1,000 of 81·6, or fractionally below the rate in 1899, and lower than the decennial average rate by 8·9. Among the admissions were 28 for affections of the mouth and throat, 19 for diarrhœa, 15 for indigestion, 9 for hepatic affections, and 5 for piles. One death occurred from abscess of liver.

Diseases of the Lymphatic System.—There were 31 admissions, giving a ratio of 30·1 per 1,000, or a decrease on the previous year's rate of 35·1, and on that of the decennial average of 20·1. The ratio of inefficiency under this head in the year under report was 3·57, as compared with 8·85 and 5·97 in the two comparisons. As in previous years, most of the admissions occurred at Colombo.

Diseases of the Urinary System caused 5 admissions, including 3 of hæmaturia and 2 of acute nephritis. All the cases recovered, and call for no remarks.

For *diseases of the generative system* 50 admissions are shown, as against 52 in the preceding year. There were 21 cases of ulcer of penis, 13 of soft chancre (already accounted for under venereal diseases) 6 of orchitis and 5 of balanitis. The ratio per 1,000, 48·5, shows an increase, as compared with that of the previous year, of 11·2, and with that of the decennial average, of 2·6.

Diseases of the Organs of Locomotion caused 9 admissions, or a ratio of 8·7 per 1,000, which is above that of the previous year by 1·5, and is practically the same as the decennial average rate. As was also the case in the foregoing year, synovitis was the chief cause of admission.

Diseases of the Connective Tissue.—There were 39 admissions, equal to a ratio of 37·9 per 1,000, which shows a decrease as compared with the previous year of 7·3, but an increase in comparison with the decennial average rate of 5·2.

Diseases of the Skin were the cause of 87 admissions, giving a ratio of 84·5 per 1,000, or lower than the rate in 1899 by 20·2, but higher than the decennial average rate by 3·9. Ulcers, boils, and eczema were the chief causes of admission.

Ceylon.

INJURIES were the cause of 84 admissions, equal to a ratio of 81·6 per 1,000, which is lower than the previous year's rate and that of the decennial average by 5·2 and 3·5 respectively. No admission is recorded under *general injuries*, but a death resulted from suffocation from submersion, the man being drowned while swimming across a river swollen with rain, in pursuit of an escaped prisoner. The admissions for *local injuries* were mostly due to wounds, sprains, contusions, and fractures. One admission occurred from gunshot wound, the result of an accident—a pellet from a shot-gun having penetrated the eyeball, and necessitating the removal of the eye.

SURGICAL OPERATIONS comprised excision of eyeball (1), removal of lymphatic glands (3), and operations on the abdomen (1), for abscess of liver. The anæsthetics used were chloroform in 4 cases, and ethyl chloride spray in 1 case. Recovery resulted in all, except the case of abscess of liver.

INVALIDING.—There were 20 men invalided to England during the year, equal to a ratio of 19·42 per 1,000, which is higher than the rate for the previous year by 2·22, but lower than the decennial average rate by ·13. Of the men invalided, 10, or 37·31 per 1,000 belonged to the Artillery, 6, or 68·97 per 1,000, to the Engineers, 2, or 3·14 per 1,000, to the Infantry, and 2, or 51·28, to Garrison Staff and Departments.

Owing to the information regarding the ages of the garrison not being obtainable, the age statistics of the men sent home as invalids cannot be given, but with regard to service in the Command, 2 men, or 3·24 per 1,000, were in their first year, 5, or 21·65 per 1,000, were in their second year, 6, or 71·43 per 1,000, were in their third year, and 7 men, or 71·43 per 1,000, had served more than three years in the Command. The corresponding ratios for these periods in the previous year were 6·37, 64·22, 42·37, and 71·43 per 1,000.

The principal causes of invaliding were tubercle of lung and debility, 4 cases each, and 2 cases each of secondary syphilis, anæmia, and disordered action of the heart.

There were 5 men discharged as medically unfit for further service, the ratio being 4·85 per 1,000, as compared with 3·59 in the previous year, and 10·31, the decennial average rate.

The causes of discharge were tubercular diseases and debility 2 cases each, and abscess of liver 1 case.

OFFICERS.—In an average strength of 61 there were 29 cases of sickness, equal to a ratio per 1,000 of 475·4, which is less than that of the previous year by 185·3. The cases include 7 of digestive disorders, 6 of simple continued fever, and 5 of local injuries. A fatal case of enteric fever occurred in an officer who had recently arrived in the island from South Africa. There was no invaliding among the officers during the year.

WOMEN.—The average strength was 51, and there were 77 admissions, equal to a ratio of 1,509·8 per 1,000, which is lower than the preceding year's rate by 95·8. The chief causes of admission were debility 27 cases, ague 19, and diseases of the nervous system, disorders incidental to women, and diseases of the skin 5 cases each. A fatal case of syncope occurred.

CHILDREN.—With an average strength of 93, there were 67 admissions and 1 death, equal to ratios per 1,000 of 720·4 and 10·75, which are lower than the corresponding ratios in the preceding year by 18·4 and 19·10 per 1,000 respectively. Among the admissions were 21 cases of conjunctivitis, 9 of bronchitis, 7 of malarial fever, 5 cases each of digestive disorders and diseases of the skin, and 4 of debility. The death was due to eclampsia.

VACCINATION.—There were 9 cases of primary vaccinations, and 16 re-vaccinations among the children, failure resulting in 6 and 7 instances respectively.

II.—Asiatic Troops.

Ceylon.

The Asiatic troops were composed of two companies of the Ceylon-Mauritius Battalion, Royal Artillery, average strength 158, and the Ceylon (Submarine Mining) Company, Royal Engineers, average strength 47, or a total average strength of 205. One company of the Artillery was stationed at Colombo, and the remainder of the Asiatic troops at Trincomali.

The admissions to hospital numbered 213, equal to a ratio of 1,039·0 per 1,000, a decrease, as compared with the preceding year, of 711·0, and there were 4·97 men constantly sick, or a ratio of 24·24 per 1,000, as compared with 43·27 in 1899. One death occurred from remittent fever, and one man was discharged the service as medically unfit for further service, from debility. The average sick time to each soldier was 8·85 days, and the average duration of each case of sickness 8·52 days, the former being shorter by 6·94 days and the latter by ·50 of a day as compared with the figures of the previous year. The chief cause of sickness was malarial fever (chiefly ague), which contributed 61 of the admissions, skin diseases coming next with 42 cases, chiefly ulcers and boils, followed by local injuries, 20 cases, digestive disorders, 17, parasitic diseases, 14, simple continued fever, 9, and dysentery, 7 cases.

Most of the admissions for malarial fever occurred at Trincomali, only 10 cases being recorded at Colombo. No surgical operations of any importance were performed. The health of the women and children is stated to have been excellent.

Sanitary Conditions.

The Senior Medical Officer (Lieut.-Colonel R. H. Quill, M.B., R.A.M.C.) reports that during the year the general sanitary condition of all the stations occupied by the troops has been satisfactory.

At *Colombo*, the latrines in the compound of the head-quarter buildings have been reconstructed, and a new bath-room has been erected at the native hospital. At *Kandy*, the swampy portion of ground in the station hospital compound, alluded to in last year's report, has now been removed. A bath for venereal patients and a latrine for natives have been provided at the station hospital. At *Trincomali*, mosquitoes, (principally the *Culex* species), are said to be very prevalent, and the medical officer in charge has taken steps for the constant removal of pudd'es of rain water, and for the treatment of all collections of water which cannot be drained away, or otherwise got rid of, by small quantities of kerosene oil. An ice-machine is noted as being urgently required, and representations to this effect have been made. A new block of barracks is being built at Ostenburg, which will give ample accommodation for the European troops. A new block of officers' quarters is shortly to be commenced at Fort Frederick, and the foundations of a new sergeants' mess at the top of the hill near the flagstaff have been dug out. The new block of married quarters is nearing completion, and two quarters for staff sergeants have been completed and brought into occupation during the year. The sanatorium at *Newera Eliya* was, in accordance with the usual practice, occupied from September, 1899, till May, 1900, and re-opened again in the following September. The Senior Medical Officer reports "that residence in Newera Eliya invariably improves to a remarkable extent the health of the troops," and further remarks on "the great benefit which would accrue to the health of troops in the Command were a well-equipped sanatorium on a fixed basis established in the hill station of Ceylon

During the year two large camps were established at *Diyatalawa*, in connection with the large number of Boer prisoners of war who have been deported to Ceylon. The sanitary arrangements of these camps have been most carefully worked out, and in all respects are said to have been satisfactory.

XIII.—ON THE HEALTH OF THE TROOPS SERVING IN CHINA.

Sickness and Mortality.

I.—European Troops.

China.

The average strength of the warrant officers, non-commissioned officers and men serving in China, exclusive of the expeditionary force, was 1,484. The troops present throughout the year were three companies Royal Garrison Artillery, an infantry battalion, detachments of the Royal Engineers, Army Service, Royal Army Medical, Army Ordnance and Army Pay Corps, and Garrison Staff.

The Siege Train, Royal Garrison Artillery, which was part of the China Expeditionary Force, arrived on the 2nd November. The troops which left Hong Kong for active service in North China consisted of 324 officers and men of the Royal Welsh Fusiliers and small detachments of the Royal Engineers, Army Service Corps, Royal Army Medical Corps, Army Pay Corps, and Army Ordnance Corps. These, excepting such as were killed in action or died of disease, subsequently returned to Hong Kong.

The following table shows the admission, mortality and invaliding rates among these troops :—

1900. Average Strength.	Admissions.	Deaths.			Invalids.		Average constantly Sick.	Ratio per 1,000 of Strength.				
		In the Command.	Of Invalids	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
1,484	1,986	23	3	26	69	13	123·98	1,338·3	17·52	46·49	8·76	83·54

As compared with the previous year, the admission and constantly sick rates show a decrease to the extent of 374·4 and 29·93 per 1,000 respectively, but that of mortality shows an increase of 5·35 per 1,000. In comparison with the decennial average rates, those of admission and constantly sick are lower by 195·7 and ·23, while the death rate is higher by 5·96 per 1,000. The average sick time to each soldier was 30·49 days, which is shorter than in the previous year by 10·93 days, and fractionally below the average. The average duration of each case of sickness, 22·78 days, is also shorter by 1·40 days as compared with that given for 1899, but is longer than the average by 2·85 days.

In Abstract XXIX is a table showing the health statistics for the several regiments and corps which served in China, exclusive of the expeditionary force, during the year. The highest admission rate occurred in the 25th Company Eastern Division, Royal Garrison Artillery, with 1,652·8 per 1,000. Omitting corps with a strength below 100, the next highest admission rate was in the 2nd Battalion Royal Welsh Fusiliers, with 1,517·9 per 1,000. The Royal Artillery as a whole gave a ratio of 1,425·2, and the Royal Engineers one of 631·2 per 1,000. The mortality rate was highest in the Royal Engineers with 27·93, the next being 21·58 in the 38th Company, Southern Division, Royal Garrison Artillery, the lowest being in the 25th Company, Eastern Division.

As to the influence of age on sickness and mortality, it is observed that the admission rate in men under 20 years was 1,972·2 per 1,000, among men between 20 and 25 years, 1,420·6 per 1,000, among those between 25 and 30 years, 1,339·4 per 1,000, and among men over 30 years of age, 884·6 per 1,000. The corresponding ratios in the previous year were 1,827·6, 2,250·5, 1,066·9, and 601·3 respectively. Of the deaths in the Command, 8, or 11·14 per 1,000, occurred in men between 20 and 25 years of age, 12, or 21·89 in men between 25 and 30 years, and 3, or 16·48 per 1,000, in men over 30 years of age. In the previous year the highest mortality rate occurred among men above 30 years, and the lowest among men between 25 and 30. *China.*

With regard to service in the Command, the admission rate for men in their first year, was 1,329·3, among those in their second year, 1,025·4, among those in their third year, 3,202·1, and among men with 3 years and over in the Command 1,067·3 per 1,000. In 1899 the corresponding ratios were 1,935·2, 1,433·1, 595·2, and 500·0 per 1,000 respectively. The deaths were 3, or 17·96 per 1,000, among men in their first year, 9, or 8·78 among men in their second year; 8, or 42·55 among men in their third year, and 3, or 28·85 per 1,000, among men of more than 3 years' service in the Command. In the previous year the highest mortality rate was among men with above 3 years in the Command.

The principal statistics of sickness and mortality, arranged according to the various sections of disease, are given in Abstract XVI.

GENERAL DISEASES.—There was no case of *eruptive fever* among the troops during the year. There was 1 admission for *bubonic plague*, equal to a ratio of ·7 per 1,000. In the previous year there were 2 admissions with 1 death.

Influenza caused 2 admissions or a ratio of 1·3 per 1,000. In the previous year there was only 1 admission.

Enteric Fever.—Under this head there were 5 admissions and 1 death, the equivalent ratios being 3·4 and ·67 per 1,000. In the previous year there was no admission recorded, but in comparison with the decennial average rate increase is observed in the rates of admission and mortality to the extent of 1·7 and ·12 respectively. The percentage of mortality to attack in the year under report equals 20·0 and that of the decennial period 33·3. Of the cases, 2 occurred in the Command; the first was in a sergeant of the Royal Artillery, which occurred in the month of February, the cause of which could not be traced; the second was in a corporal of the Royal Welsh Fusiliers; the man was admitted in April from Mount Austin Barracks, and had occupied a room under the officers' w.c.'s, the drain from which was found broken outside his window, and there was a stuffy smell in the room. No further cause could be discovered. The remaining 3 cases were imported from North China and in one of these the death occurred.

Other Continued Fevers.—No admission occurred as compared with 6 in the previous year.

Dysentery.—There were 16 admissions with 2 deaths, giving ratios of 10·8 and 1·35 per 1,000. The admission rate has increased by 9·6 as compared with the previous year and by 3·5 in comparison with the decennial average rate. Some cases of a severe type are stated to have been imported from North China.

Malarial Fevers caused 629 admissions and 4 deaths, the equivalent ratios per 1,000 being 423·8 and 2·70 respectively. Compared with the previous year's rates, that of admission shows a decline of 80·8 and that of death one of ·34 per 1,000, and in comparison with the decennial average rate the admission rate is lower by 83·8, but that of mortality is practically the same. Of the cases, 558 were for ague and 71 with the 4 deaths were for remittent fever.

Tubercular Diseases accounted for 4 admissions. The ratio, 2·7 per 1,000, is lower than the rate of the previous year and than the decennial average rate by 1·6 and 1·2 respectively. Two of the admissions were for tubercle of lung.

Venereal Diseases.—There were 38 admissions for *primary syphilis*, equal to a ratio of 25·6 per 1,000, as compared with 73·0 in the previous year, and 61·2 the average rate. If to this be added the sickness from soft chancre, which caused 93 admissions with 8·03 men constantly sick, the total

China.

admission ratio for primary venereal sores equals 88·3, which is below the previous year's and the average rates by 139·9 and 112·2 per 1,000 respectively. *Secondary syphilis* gave 116 admissions, equal to a ratio of 7°·2 per 1,000, which is above the preceding year's rate by 9·4, and that of the decennial average by 12·8. There were 3 deaths, including 1 of an invalid, recorded under this head.

Gonorrhœa caused 169 admissions, giving a ratio of 113·9 per 1,000, which is below the ratio in the preceding year by 165·5 and that of the decennial average by 81·5.

Including all forms of venereal disease the total admission ratio equalled 280·4 per 1,000, which is 296·0 and 180·9 respectively below the previous year's rate and the average rate for the preceding ten years. The total of constant inefficiency from these diseases equalled 28·02 per 1,000, which is lower than the previous year's and the decennial average rates by 28·57 and 10·32 respectively.*

For *Parasitic Diseases* there were 22 admissions, or a ratio of 14·8 per 1,000, which shows a decrease as compared with the previous year's and decennial rates of 12·6 and ·7 respectively. Ringworm caused 15 of the admissions.

Alcoholism caused 21 admissions, giving a ratio of 14·1 per 1,000, as compared with 4·3 in the previous year, and 3·2 the decennial average rate. There were 6 cases of delirium tremens with 4 deaths.

Rheumatism gave 35 admissions, or a rate of 23·6 per 1,000, which is below the rate in 1899 by 9·3, but almost identical with the average for the preceding ten years.

Debility caused 23 admissions, equal to a ratio of 15 5 per 1,000, which, compared with the previous year's rate shows a slight increase (·3), but a decrease of 4·7 as compared with the average rate.

For *other general diseases* there were 16 admissions, 9 of which were for anæmia, and 5 for non-malignant new growth.

Local Diseases.—*Diseases of the Nervous System* were the cause of 32 admissions, giving a ratio of 21·6 per 1,000, which exceeds the ratios of the preceding year and decennial average by 6·4 and 12·4 respectively. The cases comprised 14 of neuralgia, 5 of multiple neuritis, 4 each of vertigo and nervous weakness, 2 each of mania and melancholia, and 1 of megrim.

Diseases of the Eye caused 17 admissions, equal to a ratio of 11·5 per 1,000, which is below the previous year's rate by 3·1 but above that of the decennial average by 2·0. Most of the cases were for conjunctivitis.

Diseases of other Organs of Special Sense.—There were 41 admissions giving a ratio of 27·6 per 1,000, which is above the previous year's rate and that of the decennial average by 6·9 and 4·2 respectively. Excepting 1 admission for nasal affection, all were for aural disease.

Diseases of the Circulatory System gave 28 admissions. The ratio, 18·9 per 1,000, exceeds the ratios of the previous year and the decennial average by 8·6 and 4·0 per 1,000 respectively. The causes of admission were:—disordered action of the heart 17 cases, valvular disease of heart 6, varix 4, and phlebitis 1 case. A death occurred, out of hospital, from rupture of artery.

Diseases of the Respiratory System were the cause of 66 admissions or a ratio of 44·5 per 1,000, which is higher by 12·2 and 15·7 respectively, than the previous year's rate and that of the decennial average. Bronchial affections numbered 54 cases, and there were 7 cases of pneumonia and 3 of pleurisy. A death, that of an invalid, occurred from pneumonia.

Diseases of the Digestive System.—Under this head 203 admissions occurred, the equivalent ratio being 136·8 per 1,000, which is an increase of 20·6 on the ratio for 1899, and of 35·9 on the decennial average rate. The chief causes of admissions were diarrhœa 55 cases, affections of the mouth and throat 52 cases, hepatic disorders 34, dyspepsia 29, piles 16, and colic 5 cases.

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* There was no admission for ulcer of penis of non-venereal origin.

A death occurred from [illegible] Command died from gastritis.

Diseases of the Lymphatic System caused [illegible] 22·2 per 1,000, showing a [illegible] decennial average rates of [illegible]

Diseases of the Urinary System [illegible] which is an increase of [illegible] average. There were 2 deaths, one [illegible] disease.

Diseases of the Generative System caused [illegible] 86·2 per 1,000, and shows [illegible] as compared with the rate [illegible] rate. In addition to 93 cases [illegible] heading of venereal diseases there were 13 cases [illegible] of urethra and balanitis, 3 [illegible] hydrocele.

Diseases of the Organs of Locomotion caused [illegible] of 10·8 per 1,000, which compared with the rate [illegible] and the decennial average rate, [illegible] with the latter of ·3. [illegible]

Diseases of the Connective Tissue caused [illegible] 27·6, which shows an increase of [illegible] a decrease of 1·5 in comparison with the decennial average rate. There were 25 cases of inflammation and 10 of abscess.

Diseases of the Skin.—The admissions from [illegible] per 1,000, which is less than the [illegible] decennial average by ·5 and 3·1 respectively. The chief causes of admission were boils (31 cases, about 17% [illegible] and eczema (5).

INJURIES.—There were 175 admissions and 2 deaths. The admission rate, 118·0 per 1,000, is exactly the same as in the previous year, but 1·6 above the decennial average rate. Under [illegible] cases of heat-stroke and 1 of multiple injuries, and there were 2 deaths, 1 from heat-stroke and 1 from suffocation by submersion. The admissions for *local injuries* included 45 sprains, 47 wounds, 30 contusions, 15 abrasions, 14 blisters of feet, and 9 of fracture. There were 2 deaths, one from fracture of skull.

SURGICAL OPERATIONS comprised [illegible] removal of sharp ends of bone from stump, [illegible] on account of necrosis of lower jaw, [illegible] of varix, and ligature of piles in three cases. The [illegible] chloroform in every instance. The results were [illegible]

INVALIDING.—There were 69 men [illegible] equal to a ratio of 46·49 per 1,000, which is [illegible] previous year, but 4·53 above the decennial average rate. Of these, 22, or 46·31 per 1,000, belonged to the Royal Artillery, [illegible] to the Royal Engineers, 41, or 54·30, to the Infantry, and [illegible] Garrison Staff and Departments. As to the ages of the men invalided, 39 men, or 54·32 per 1,000, were between 20 and 25 years of age, [illegible] between 25 and 30, 3, or 22·39 per 1,000, were between 30 and 35 years of age, [illegible] or 125·00 per 1,000, were over 35 years of age. The corresponding ratios were for men under 20 years of age 34·[illegible] groups were 68·23, 40·15, 27·27 and 16·[illegible] per 1,000.

With regard to service in the Command, 3 [illegible] their first year, 43, or 41·35 per 1,000, were [illegible] men, or 122·34 per 1,000, were [illegible] mand. In the previous year the [illegible] and 35·71 per 1,000.

The principal causes of invaliding were [illegible] syphilis 11, debility 8, heart affection[illegible]

China. mental disorders), local injuries 4, tubercular diseases and diseases of the lymphatic system 3 cases each, and gonorrhœa and aural disease 2 cases each.

There were 13 men discharged as medically unfit for further service, equal to a ratio, 8·76 per 1,000, as compared with 4·26 in the previous year, and 14·93, the decennial average rate. The causes of discharge were 4 for tubercular diseases, 3 for circulatory diseases, 2 for mental diseases, and 1 case each for secondary syphilis, disorder of the ear, respiratory ailments, and local injuries.

OFFICERS.—In an average strength of 74 there were 68 cases of sickness, equal to a ratio of 918·9 per 1,000, which is higher by 204·6 per 1,000 than the previous year's ratio. The cases include 14 of remittent fever, 8 of dysentery, 6 of ague, 5 influenza, and 3 of gastritis. There was 1 death which was returned as ague, and 10 officers were invalided, for dysentery (4), remittent fever (1), rheumatism (1), debility (1), hernia (1), diarrhœa (1), and synovitis (1).

WOMEN.—The average strength was 77, and there were 133 admissions, equal to a ratio of 1,727·3 per 1,000, which is 315·5 above the preceding year's rate. Malarial fevers and debility were the chief causes of admission, the former contributing 57, and the latter 18 cases. Next to these came bronchial affections 9 admissions, urinary diseases 7, digestive disorders 6, and anæmia 5. There was no death.

CHILDREN.—In an average strength of 145, there were 257 admissions and 5 deaths, equal to ratios of 1,772·4 and 34·48 per 1,000 respectively, both of which are below the corresponding ratios in the preceding year by 367·4 and 7·48 per 1,000. There were 91 cases of malarial fever, 44 of bronchial affections, 28 of skin disease, 28 of digestive disorders (including 21 of diarrhœa), 25 of chicken pox, 9 of debility, 9 of local injuries and 7 of parasitic disease. The deaths were 2 from enteritis, and 1 each from ague, bronchitis, and diarrhœa.

VACCINATION.—There were 53 cases of primary vaccination amongst the children, 14 of which were failures; among the men there were 56 of re-vaccination with 32 failures, and among the women 42 re-vaccinations with 4 failures. The lymph is obtained from the Local Government Vaccine Institute.

II.—ASIATIC TROOPS.

The force consisted of the Hong Kong-Singapore Royal Artillery, average strength 312, the Chinese Section (Submarine Mining) Royal Engineers 55, the Hong Kong Regiment 524, 3rd Madras Light Infantry 308, 22nd Bombay Infantry, 305, 5th Infantry Hyderabad Contingent 236, 1st Bengal Lancers 88, and men of other corps 7. The total average annual strength was 1,785 and the admissions to hospital 1,952. There were 17 deaths, 3 of which occurred on furlough, two in India and one in China. There were five men discharged as invalids, and there were 78·56 men constantly sick.

The admission rate equalled 1093·5 per 1,000, that of mortality 9·52, and the constantly sick rate, 44·01 per 1,000. The admission and constantly sick rates are lower by 340·4 and 4·98 respectively, but those of mortality and invaliding are higher by 1·97 and 43·34 per 1,000, as compared with the previous year's ratios.

Malarial fevers caused 743 admissions, 6 of which were for remittent fever and the remainder for ague. There were 217 admissions for dysentery, 187 for respiratory diseases, 82 digestive disorders, 80 diseases of the skin, 73 venereal diseases, including 21 of soft chancre, 68 diseases of the eye

chiefly conjunctivitis, 64 debility, and 27 parasitic diseases, among which were 20 cases of ringworm and 3 of guinea worm. *China.*

The causes of death were 2 each from plague, remittent fever, dysentery and tubercle of lung, and 1 each from ague, acute phthisis, chronic phthisis, pneumonia, suffocation from submersion, fracture of vault of skull and wound of liver, also 2 deaths, cause unknown, of men on furlough.

The Principal Medical Officer states that the general health of these troops has been good, but owing to the many changes and new arrivals during the year, the deductions to be drawn are less reliable than in previous years.

Sanitary Conditions.

The Principal Medical Officer (Lieut.-Colonel G. A. Hughes, M.B., D.S.O., R.A.M. Corps) reports that all the barracks, forts and buildings occupied by the troops and their families in the Command were kept in a good sanitary condition. The position of the majority of the barracks, being on a low level in the eastern part of the City of Victoria and surrounded by a dense population, is unsatisfactory; in the hot season they receive little or no benefit from the south-west monsoon, and the effect on the general health of the troops is enervating and debilitating and particularly so on the soldiers' wives and children.

The close proximity of the Chinese population to the barracks and hospital, in itself constitutes a grave danger to the troops during the outbreaks of epidemic disease. Plague has been endemic since 1896.

A new recreation ground having recently been opened in the Happy Valley, about a mile and a half from barracks, it is hoped that the exercise and recreation afforded to the men will result in a better state of health.

A soldier's club has also been established by the General Officer Commanding, where cheap and wholesome food can be procured and good liquor can be obtained.

The Hong Kong Station Hospital (converted barrack-rooms) overhanging a crowded thoroughfare, is very unsatisfactory, and though a site for a modern hospital, some 400 feet above sea-level, has been chosen and prepared over 2 years ago, it has not yet been commenced.

The hospital for soldiers' wives and children is also stated to be very unsuitable for the purpose. It is very hot and oppressive in summer, and in a very noisy locality, and the sanitary arrangements in connection with it are far from good.

The lighting of the barrack rooms is again complained of, and the desire is expressed that the electric light should be introduced into both barracks and hospital.

The daily beef ration is again stated to be very monotonous. A cargo of frozen Australian mutton arrived in Hong Kong at the end of the year; some of this was obtained and issued once a week, and was highly appreciated by the men, but as no means exist in Hong Kong for keeping a cargo of meat, and a less supply not being obtainable, it is most desirable that a cold storage room should be erected.

Many sanitary recommendations, of a minor character, on being brought to notice, were carried out.

The "Women and Girls' Protection Ordinance" referred to in the previous year, is stated to have worked well in diminishing the number and severity of admissions for venereal diseases.

XIV.—ON THE HEALTH OF THE TROOPS SERVING IN THE STRAITS SETTLEMENTS.

Sickness and Mortality.

I.—European Troops.

Straits Settlements.

The average strength of warrant officers, non-commissioned officers, and men serving in the Straits Settlements was 527. The troops stationed in the Command throughout the year were Nos. 12 and 35 Companies, Southern Division, Royal Garrison Artillery, detachments of the Royal Engineers, Army Service Corps, Royal Army Medical Corps, Army Ordnance Corps, and Army Pay Corps.

The 1st Battalion Royal Lancaster Regiment left for England in February, and during the remaining portion of the year there was no European regiment serving in the Command.

In the following table are given the admission, mortality, and invaliding rates, &c., among the troops serving in the Command :—

1900. Average Strength.	Deaths.				Invalids.		Average constantly Sick.	Ratio per 1,000 of Strength.				
	Admissions.	In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.		Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
527	338	4	—	4	23	8	24·22	641·4	7·59	43·64	15·18	45·93

The admission and constantly sick rates are lower than in 1899 by 566·2 and 21·31, and than the average rate for the preceding ten years by 483·5 and 26·07 respectively, while the mortality rate is higher by 1·38 and ·93 respectively in the two comparisons. The average sick time to each soldier was 16·77 days, which is shorter by 7·78 days than in 1899 and than the average period for the ten years 1890–1899 by 9·52 days. The average duration of each case of sickness was 26·15 days, which is longer than in the previous year by 5·82 days and than the average period by 2·78 days.

In Abstract XXIX is a table showing these health statistics for the various regiments and corps which served in the Command during the year. In the Royal Artillery the admission ratio was 702·8 and the constantly sick rate 57·15 per 1,000, as compared with 968·4 and 97·93 in the previous year. There were 4 deaths as against 3 in 1899. In the Engineers, the admission rate was 640·0 per 1,000, the corresponding ratio in the previous year being 596·2. In the Infantry, with an annual average strength of 148, the admission rate was 641·9 per 1,000, the death rate *nil*, and the constantly sick rate 41·56 per 1,000, the corresponding ratios for the previous year being 1,370·2, 5·88 and 64·84. In the detachments of other corps the ratios of sickness were, as usual, comparatively low.

Taking the sickness and mortality according to age, it is found that among men under 20 years of age the admission rate was 428·6 per 1,000, among men between 20 and 25 years of age 717·9 per 1,000, among men between 25 and 30 years 637·7 per 1,000, among men between 30 and 35

years 406·8 per 1,000, and among men of 35 years of age and upwards 550·0 per 1,000. In the previous year the highest admission ratio was among men 20 years of age. There were 2 deaths among men between 20 and 25 years of age, giving a ratio of 8·55 per 1,000, and 2 among men between 25 and 30 years of age, or a ratio of 9·66 per 1,000. *Straits Settlements.*

With regard to the influence of length of service in the Command, the admission rate among men in their first year of service was 727·3 per 1,000, among men in their second year 575·5 per 1,000, among men in their third year 810·0 per 1,000, and 200·0 per 1,000 among men having over three years' service in the Command. In the previous year the highest ratio was among men in their second year of service in the Command. The mortality rate was 4·08 among men in their second year (1 death), 13·57 per 1,000 among men in their third year (3 deaths) and *nil* in the other groups.

In Abstract XVII is a table showing the principal statistics of sickness and mortality, arranged according to the various sections of disease.

General Diseases.—There was no admission under the head of *eruptive fevers*, and *enteric fever* was also unrepresented. *Influenza* caused 3 admissions, or a ratio of 5·7 per 1,000, as compared with *nil* in 1899.

Other continued fevers caused 22 admissions, equal to a ratio of 41·7 per 1,000, which is lower than the rate in 1899 and than the decennial average ratio by 70·0 and 17·2 respectively.

A fatal case of *cholera* occurred. The disease was supposed to have been contracted in the town of Singapore, where, at the time, the disease was prevalent among the native civil population. *Dysentery* caused 4 admissions, giving a ratio of 7·6 per 1,000, which is higher than similar rates for the previous year and the decennial average period by 4·2 and 1·8 respectively.

Malarial fevers, with 71 admissions, gave a ratio of 134·7 per 1,000, which is below the previous year's rate and that of the ten years' average by 273·6 and 74·8 respectively. There were 2 cases shown as remittent fever, all the remainder being cases of ague.

Septic Diseases caused no admission.

Tubercular Diseases were represented by 2 admissions for tubercle of lung, with a ratio of 3·8 per 1,000, or higher than the rate in 1899, and the decennial average ratio by ·4 and 1·1 respectively.

Venereal Diseases.—Primary syphilis caused 7 admissions, equal to a ratio of 13·3 per 1,000, which is less than in the preceding year by 4·6 and than the rate for the preceding ten years by 100·8. If to this be added the sickness from soft chancre, which gave 8 admissions and 1·21 men constantly sick, the total admission ratio for primary venereal sores equalled 28·5 per 1,000, which is 67·3 below the previous year's rate and 152·2 below the average of the preceding ten years. *Secondary syphilis* was the cause of 27 admissions, equivalent to a ratio of 51·2 per 1,000, which is lower than the rate in the previous year by 17·1 and than the decennial average rate by 63·1. *Gonorrhœa*, with 40 admissions, or a ratio of 75·9 per 1,000, is below the previous year's rate by 38·6 and that of the decennial average rate by 70·5 per 1,000. Including all forms of venereal disease, the total admission rate was 155·6 per 1,000, which is lower than the previous year's rate by 123·0 and than the average rate by 285·8. Two deaths occurred during the year, one from secondary syphilis and one from gonorrhœa with septicæmic symptoms. The total amount of constant inefficiency from these diseases equalled 15·67 per 1,000, which is below the previous year's rate by 11·36 and also below the decennial average by 23·47.* The acting Senior Medical Officer remarks that venereal disease "appears to be gradually declining" and that he is of opinion that "this satisfactory state of affairs is mainly owing to the more stringent measures put into force by the New Ordinance introduced locally."

Parasitic Diseases.—There was no admission under this heading, as compared with 20 cases in 1899.

There was 1 admission for *alcoholism* recorded, equal to a ratio of 1·9 per 1,000, as compared with 2·1 in the previous year.

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* There was no admission for ulcer of penis of non-venereal origin.

Straits Settlements.

Rheumatism.—Under this head are shown 8 admissions, equal to a ratio of 15·2 per 1,000, which is higher than the previous year's rate by 1·4, but lower than the decennial average rate by 1·2.

Debility caused 7 admissions, or a ratio of 13·3 per 1,000, which is a decrease of 19·1 on the rate for 1899, and of 1·9 on the average rate for the preceding ten years.

Other General Diseases.—Only 1 admission, for non-malignant new growth, is returned under this heading.

Local Diseases.—*Diseases of the Nervous System* caused 4 admissions, or a ratio of 7·6 per 1,000, which is higher than the rate for the previous year by 1·4, but lower than the average for the preceding ten years by 1·3. The cases were 1 each of multiple neuritis, megrim, neuralgia and dementia.

Diseases of the Eye gave 3 admissions, equal to a ratio of 5·7 per 1,000, which is lower than the preceding year's rate by 6·7 and than the decennial average rate by 5·1. The admissions were all due to conjunctivitis.

Diseases of other Organs of Special Sense, with 3 admissions, gave a ratio of 5·7 per 1,000, which is less than that in the previous year by 17·1 and than the average rate by 10·3. Two of the admissions were due to inflammation of middle ear, and 1 to inflammation of external meatus.

There were no admissions for *diseases of the circulatory system.*

Diseases of the Respiratory System caused 8 admissions, or a ratio of 15·2 per 1,000, a fractional increase as compared with the rate in the previous year, but a decrease of 2·8 in comparison with the average rate for the ten years 1890–99. The admissions comprised 5 cases of bronchial affections, and 1 case each of hæmorrhage of lung, pneumonia and phthisis.

Diseases of the Digestive System caused 27 admissions, equal to a ratio of 51·2 per 1,000, or a decrease in comparison with the previous year's and the decennial average rates of 4·7 and 10·0 respectively. Diarrhœa, mouth and throat affections, dyspepsia and colic were the chief causes of a lmission.

Diseases of the Lymphatic System contributed 8 admissions, giving a ratio of 15·2 per 1,000, as compared with 31·7 in the previous year and 35·8 the average rate for the preceding ten years. Seven of the admissions were due to inflammation and 1 to suppuration of lymphatic glands.

Diseases of the Urinary System caused 1 admission, due to incontinence of urine, the ratio being 1·9 per 1,000, as compared with 2·1, the ratio in 1899, and 2·0, the decennial average ratio.

Diseases of the Generative System, with 16 admissions, gave a ratio of 30·3 per 1,000, which is below the rate in the previous year by 70·4 and that of the decennial average period by 55·7. In addition to 8 admissions for soft chancre, already referred to under the heading of venereal diseases, the cases included 7 of orchitis and 1 of balanitis.

For *diseases of the organs of locomotion* there were 4 admissions, 2 cases being due to synovitis, and 1 each to periostitis and necrosis of bone. The ratio per 1,000, 7·6, is lower than the ratio for the preceding year and that of the decennial average by 5·5 and ·7 respectively.

Diseases of the Connective Tissue caused 8 admissions, equal to a ratio of 15·2 per 1,000, a decrease of 9·6 as compared with the rate for 1899, and of 14·6 as compared with the decennial average rate.

Diseases of the Skin gave 13 admissions, equal to a ratio of 24·7 per 1,000, and show a decline of 16·0 in comparison with that for the preceding year, and one of 17·8 in comparison with the average rate. Among the cases were 4 of eczema, 3 of boils, and 3 of ulcer.

Injuries caused 49 admissions, or a ratio of 93·0 per 1,000, which shows, as compared with the previous year s rate, an increase of 10·9, and with the ten years' average rate one of 7·0 per 1,000.

There was no admission for *general injury*, but a death resulted from suffo ation from submersion. The man was found dead in the harbour of Singapore, and the coroner's jury returned a verdict of "found drowned." Of the cases of *local injury*, wounds, sprains, and contusions furnished the majority of the admissions.

SURGICAL OPERATIONS.—The only operation of any importance was an operation for necrosis of left parietal bone. Eucaine was the anæsthetic used, and the operation resulted satisfactorily. The patient, who was much debilitated, owing to climate and long residence in hospital, was invalided to England.

INVALIDING.—The number of men invalided home during the year was 23, giving a ratio of 43·64 per 1,000, which is higher than in 1899 by 18·12 and than the average by 25·31. Of the men invalided, 17, or 68·27 per 1,000, belonged to the Artillery, 3, or 20·27 per 1,000, to the Infantry, 2, or 20·00 per 1,000, to the Royal Engineers, and 1, or 33·33 per 1,000, to other corps. With regard to age, 11 men, or 47·01 per 1,000, were between 20 and 25, 9 men, or 43·48 per 1,000, were between 25 and 30, 1 man, or 16·95 per 1,000, was between 30 and 35, and 1 man, or 50·0 per 1,000, was over 35 years of age. As to length of service in the Command, 5 men (in an average annual strength amounting to 11), or 454·55 per 1,000, were in their first year, 6 men, or 24·49 per 1,000, were in their second year, and 12 men, or 54·30 per 1,000, were in their third year. No case of invaliding occurred among men who had over three years in the Command. The causes of invaliding were secondary syphilis 5 cases, enteric fever 3 cases, remittent fever, tubercle of lung and debility 2 cases each, while one each was due to ague, gonorrhœa, rheumatism, dementia, phthisis, typhlitis, soft chancre, necrosis and synovitis.

There were 8 men discharged the service as medically unfit during the year, the ratio, 15·18 per 1,000, being higher than that for the preceding year by 11·73 and than the decennial average rate by 6·17. The causes of discharge were 3 for tubercle of lung, 2 for secondary syphilis, and one each for melancholia, perforation of membrana tympani and synovitis.

OFFICERS.—In an average strength of 35, there were 22 cases of sickness, equal to a ratio of 628·6 per 1,000, as compared with 914·9 in the previous year. The chief causes of admission were ague 5 cases, simple continued fever 4, local injuries 4, and digestive disorders 2 cases. No death occurred, but three officers were invalided to England for influenza, pyæmia and inflammation of liver respectively.

WOMEN.—In an average strength of 41, there were 42 cases of sickness, the ratio being 1,024·39 per 1,000, showing a decrease as compared with the previous year's rate of 308·9 per 1,000; the death ratio was *nil*, as compared with 14·49 in 1899. Among the cases treated were 13 cases of debility, 4 of diseases connected with pregnancy, 3 of neuralgia, and 2 cases each of influenza, simple continued fever, ague, colic, diarrhœa, and whitlow.

CHILDREN.—The average strength was 93, and there were 46 admissions, equivalent to a ratio of 494·62, which is lower than the corresponding ratio in 1899 by 358·1. No death occurred, as compared with 1 in the previous year. The cases included 8 of ague, 6 of digestive disorders, 6 of skin diseases, 5 of bronchial affection, 4 each of simple continued fever, inflammation of lymph glands and local injuries, and 3 cases of dysentery.

VACCINATION.—Of 11 primary vaccinations among the children there were 6 failures, and of 19 re-vaccinations among the men, 7 among the women, and 29 among the children, failure resulted in 10, 1 and 5 cases respectively. Calf lymph obtained from the Veterinary Institute, Saigon, was used, the lymph received from Aldershot having been found useless on arrival in Singapore.

II.—ASIATIC TROOPS.

The force consisted of No. 1 Company of the Hong Kong-Singapore Battalion, Royal Artillery, and the Singapore Company Royal Engineers throughout the year. The 16th Battalion Madras Infantry arrived on 5th

Straits Settlements.

February, and remained till the end of the year. The Artillery were stationed at Blakan Mati and outlying forts, the Engineers at Pulo Brani, and the Infantry at Tanglin during the year. The average strength of the Asiatic troops was 884, the admissions numbered 647, and the average number constantly sick was 22·06. There were 2 deaths due to beri-beri and anæmia. No invalids were discharged the service. The ratio of admission, 731·9, is below the rate in the previous year by 19·6, and the ratio of constantly sick, 25·03, is also less by ·29 per 1,000. Ague, dysentery, debility, simple continued fever and venereal diseases gave the highest numbers of admissions.

SANITARY CONDITIONS.

The acting Senior Medical Officer (Captain H. E. Winter, R.A.M.C. reports that the health of the troops has been exceptionally good, and again remarks on the decrease of admissions for all forms of venereal disease. The sanitary condition of the various barracks has been, on the whole, satisfactory. The means of ablution are ample and ventilation generally is satisfactory.

At *Blakan Mati* pumps have been provided for the wells from which drinking water is obtained, and alterations have been made in the officers' mess. A pump has also been provided for the well from which drinking water is obtained at the station hospital. At *Pulo Brani* the drainage system at the Tin Works married quarters has been improved. The surface drainage generally of both these islands requires extension farther from the various buildings, and the matter is under consideration.

At *Fort Canning* the barrack-rooms have been re-roofed and the floors of urinals and latrines renewed.

There were no improvements of note at *Tanglin* during the year.

XV.—ON THE HEALTH OF THE EUROPEAN TROOPS SERVING IN INDIA.

Sickness and Mortality.

India.

The average strength of European troops serving in India during 1900 was 60,553 warrant officers, non-commissioned officers and men, as compared with an average strength of 67,697 in 1899. The decrease of 7,144 in the average strength was caused by the non-replacement of the troops sent to South Africa in 1899, and by the non-replacement since of the casualties occurring among the troops remaining in India, while the decrease was further contributed to by the despatch of troops to China in the second half of the year under report.

The following table shows the admission, death, invaliding and constantly sick rates among the troops during the year.

1900. — Average Strength.	Deaths.				Invalids.		Average constantly Sick.	Ratios per 1,000 of Strength.				
	Admissions.	In the Command.	Of Invalids.	Total.	Sent Home.	Finally discharged.		Admissions.	Deaths.	Invalids sent Home.	Invalids finally discharged.	Constantly Sick.
60,553	69,225	885	45	930	2,026	677	4,342·21	1,143·2	15·36	33·46	11·18	71·71

Compared with the corresponding ratios in the preceding year there is a decrease in the admission and constantly sick rates of 5·5 and 1·29 per 1,000 respectively, but the death rate shows an increase of 2·11 and the invaliding rate an increase of 1·89 per 1,000. Compared with the similar average ratios for the preceding ten years the admission, death and constantly sick rates show decreases of 286·0, ·68 and 16·47 per 1,000 respectively, while an increase of 4·96 is observed in the invaliding rate.

The average sick time to each soldier was 26·17 days, which is shorter than in the previous year by ·48 of a day, and less than the decennial average by 6·02 days.

The average duration of each case of sickness was 22·90 days, or ·30 of a day less than in the preceding year, but ·38 of a day longer than the decennial average.

The loss to India by deaths and invaliding to England was 2,911 warrant officer, non-commissioned officers and men, being at the rate of 48·07 per 1,000, an increase of 3·75 on the rate in the previous year, and an increase of 3·53 on the average rate for the preceding ten years.

In Abstract XIX is a table showing the prevalence of sickness and mortality in the different military districts. In 1899 the highest admission ratios occurred in the Narbudda (1,657·1), Mandalay (1,633·2) and Belgaum (1,578·4) districts. This year the highest admission ratio, 1,778·6 per 1,000, occurred in the Mandalay district, which is an increase of 145·4 over the admission ratio for 1899, when this district held the second highest place. The next highest admission ratios were 1,719·5 in the Mhow district, showing an increase of 595·4 on the previous year's rate, and 1,569·4 per 1,000 in the Deesa district, an increase of 305·5. In the Mandalay district malarial fevers caused more than half the admissions. The prevailing diseases in the

Mhow district were malarial fevers, venereal and other diseases of the generative system, diseases of the digestive system, dysentery, enteric fever and cholera, while in the Deesa district the most prevalent diseases were malarial fevers and venereal. Notwithstanding an outbreak of enteric fever and an increased admission rate for venereal disease, the Quetta district had the lowest admission ratio for the year, 727·5 per 1,000, a decrease of 188·1 on the admission ratio for 1899, the satisfactory result being chiefly due to lessened admissions for malarial fevers, rheumatism and local diseases generally. The next lowest admission ratio was 771·5 per 1,000 in the Rawal Pindi district, showing a decrease of 217·4, due for the most part to a lower admission rate for malarial fevers, local diseases and enteric fever. The Rohilkhand district shows the third lowest admission ratio, 807·2 per 1,000, a decrease of 188·9, chiefly caused by a decreased admission rate for venereal disease. The lowest admission ratios in 1899 were in the Sind (830·0), Quetta (915·6) and Rawal Pindi (988·9) districts. Among districts, other than those already referred to, which show increased admission rates the most notable instances are the Sind, Nagpur, Lahore, Rangoon and Aden districts, which in the order named show increases of 315·8, 221·8, 217·4, 213·3 and 201·3; the increase in each instance being chiefly due to an increased admission rate for malarial fevers. Excluding the three already mentioned, eleven other districts show decreased admission rates, the decreases varying from 17·3 in the Bombay district to 265·5 in the Belgaum district, the improvement in the latter district being chiefly due to lessened prevalence of malarial fevers and influenza. Other notable instances were a decrease of 249·2 in the admission ratio of the Narbudda district, where there was a large diminution in the admission rate for syphilis, and a decrease of 230·0 in the Presidency district, largely the result of decreased prevalence of malarial fevers, skin diseases and dysentery.

The highest rates of mortality were 28·52 per 1,000 in the Mhow district, 25·18 in the Secunderabad district and 22·77 in the Deesa district. Compared with the preceding year the death rates of these three district show increases of 13·35, 14·70 and 10·62 per 1,000 respectively. In 1899 the highest death rates were 18·85 in the Presidency, 18·09 in the Lahore and 17·35 per 1,000 in the Bangalore district. The districts showing the lowest death rates for the year are Bangalore (5·82), Rohilkhand (6·00), Rawal Pindi (8·02) and Sind (8·14). Compared with the death rates for 1899 increased mortality is observed in nineteen districts out of twenty-six, the increases varying from ·31 in the Presidency district to 14·70 in the Secunderabad district. Seven districts show decreased mortality, the decreases being 11·53, 4·52, 3·91, 3·10, 2·83, 2·05 and 1·71 in the Bangalore, Peshawar, Rawal Pindi, Oudh, Sirhind, Rohilkhand and Bundelkhand districts respectively.

In Abstract XX will be found the statistics of sickness and mortality at the various stations. Taking first the *stations in the plains* having an average strength of over 150 men, it is observed that Delhi gives the highest admission ratio, 2,485·6 per 1,000, an increase of 805·8 on the preceding year, and 360·6 above the decennial average; the unhealthiness being due almost entirely to an abnormal prevalence of malarial fevers. Mandalay, which also held the second highest place in 1899, comes next with an admission ratio of 2,357·9, showing an increase of 378·3 on the preceding year, and of 665·0 on the decennial average; like last year, malarial fevers were the cause of the high admission rate. The third highest ratio was 2,233·3 at Ferozepore, an increase of 642·4 on the rate for the previous year, and 331·4 above the average rate for the preceding ten years. There was an exceptional prevalence of malarial fever at this station, particularly during the last four months of the year, when the disease became very widespread and exceptionally severe in type. Barrackpore, which had the highest admission ratio in 1899, occupies the fourth place this year with a ratio of 2205·9, a decrease of 375·9 as compared with last year's rate and 122·0 below the decennial average. Malarial fevers were less prevalent than usual, but the admission ratio was kept up by an outbreak of influenza. As was also the case in 1899 Sitapur shows the lowest admission ratio, 552·9 per 1,000, which is lower than the previous

year by 153·2, and 694·6 less than the ten years' average rate. Fort Attock comes next with 774·4 showing a decrease of 539·6 on the ratio for the preceding year, while it is lower than the decennial average rate by 1,076·1. The third lowest ratio was 780·1 at Rawal Pindi, a decrease on last year of 289·4, and lower than the decennial average by 623·9. In 28 of the 61 stations in the plains having a strength of over 150 men the admission rates were higher than in 1899, the most notable instances being, in addition to those already mentioned, increases of 999·0 at Neemuch, 994·7 at Nasirabad, 948·6 at Meiktila, 828·5 at Deesa and 543·0 at Mian Mir. At Neemuch, Nasirabad and Deesa the increase was chiefly in admissions for malarial fevers and venereal disease, and at Meiktila and Mian Mir for malarial fevers. In 33 stations the admission rate showed decrease, the chief instances of considerable diminution being decreases of 594·3 at Dum Dum, 520·5 at Saugor, 489·9 at Ahmedabad, 479·5 at Campbellpore and 459·8 at Nowgong. When compared with the average ratios, the admission rates showed increase in 16 stations, notably at Deesa and Nasirabad, the increases being 517·5 and 385·0 respectively; while decreased rates were observed in 45 stations, the principal instances being decreases of 1,248·1 at Ahmedabad, 1,226·0 at Nowgong and 1,106·5 at Amritsar. Fort Lahore, with an average strength of 103 and an admission ratio of 1,679·6, had the highest ratio of mortality for the year, 58·25 per 1,000, the 6 deaths represented by this ratio being caused by cholera. Calicut, with an average strength of 88 and an admission ratio of 772·7, had a death rate of 45·45, 2 of the 4 deaths being from enteric fever, and 2 from abscess of the liver. Among stations having a strength of over 150 men, Barrackpore had the highest ratio of mortality, 55·56 per 1,000, an increase of 28·29 on the death rate for 1899, and of 29·38 on the decennial average; of the 17 deaths, 5 were due to abscess of the liver, 4 to dysentery and 2 to enteric fever. The next highest mortality ratio was 47·92 at Delhi which is 23·75 higher than in the previous year and 22·0 above the decennial average rate; 6 of the 15 deaths were caused by cholera, 3 by enteric fever and 2 by dysentery. Next comes Neemuch with a death rate of 47·14, which is higher than last year's and the decennial average rates by 26·45 and 29·45 respectively; of the 14 deaths, 4 were from enteric fever and 2 each from cholera and dysentery. Nasirabad follows with a mortality ratio of 40·97, showing increases of 23·07 and 20·95 in the two comparisons; of the 32 deaths, 21 were due to enteric fever and 5 to cholera. The only other instance of high death rate which calls for special note is one of 30·12 at Mian Mir, which is 11·36 higher than last year's rate and 4·67 above the decennial average; 10 of the 25 deaths were due to cholera, 3 to heat apoplexy, and 2 each to dysentery, abscess of the liver and ague. For the second year in succession there were no deaths at Sitabaldi (average strength 69), nor were there any during the year at Cannanore (94), Fort Chingrikal (34), Shahjahanpur (10), or Fort Fulta (8). Next to these stations, the lowest rate of mortality was 2·20 per 1,000 at Sitapur, a decrease of 5·96 on the rate of the preceding year, and of 18·23 on the decennial average rate. Fyzabad comes next with a ratio of 3·75, showing decreases of 4·67 and 10·42 in the two comparisons; and this is followed by a death rate of 4·57 at Bhamo, an increase of 1·25 on the rate for 1899, but a decrease of 4·46 on the decennial average. Of the 61 stations in the plains having an average strength of over 150 men, 33 had mortality ratios exceeding those of the previous year, the chief instances, in addition to those already mentioned, being increases of 20·51 at Ahmedabad and 20·22 at Mandalay; at Ahmedabad there were 6 deaths as compared with 2 in 1899, while at Mandalay there were 18 as compared with 5, the increased death rate being chiefly ascribed to malarial causes. The mortality ratios show decrease at 28 stations, the most notable instance being Dum Dum (the station with the highest death rate in 1899) where the mortality ratio was 22·79 per 1,000, as compared with 48·03 in the preceding year, the decrease being due to lessened mortality from malarial fevers and abscess of the liver.

India.

Among *the twelve sanitaria*, Taragarh had the highest admission ratio, 2404·3 per 1,000, which is 893·7 higher than the corresponding ratio in the previous year and 772·7 above the decennial average; the high admission rate was due to the debilitated condition of the convalescents sent to

Straits Settlements.

Rheumatism.—Under this head are shown 8 admissions, equal to a ratio of 15·2 per 1,000, which is higher than the previous year's rate by 1·4, but lower than the decennial average rate by 1·2.

Debility caused 7 admissions, or a ratio of 13·3 per 1,000, which is a decrease of 19·1 on the rate for 1899, and of 1·9 on the average rate for the preceding ten years.

Other General Diseases.—Only 1 admission, for non-malignant new growth, is returned under this heading.

LOCAL DISEASES.—*Diseases of the Nervous System* caused 4 admissions, or a ratio of 7·6 per 1,000, which is higher than the rate for the previous year by 1·4, but lower than the average for the preceding ten years by 1·3. The cases were 1 each of multiple neuritis, megrim, neuralgia and dementia.

Diseases of the Eye gave 3 admissions, equal to a ratio of 5·7 per 1,000, which is lower than the preceding year's rate by 6·7 and than the decennial average rate by 5·1. The admissions were all due to conjunctivitis.

Diseases of other Organs of Special Sense, with 3 admissions, gave a ratio of 5·7 per 1,000, which is less than that in the previous year by 17·1 and than the average rate by 10·3. Two of the admissions were due to inflammation of middle ear, and 1 to inflammation of external meatus.

There were no admissions for *diseases of the circulatory system.*

Diseases of the Respiratory System caused 8 admissions, or a ratio of 15·2 per 1,000, a fractional increase as compared with the rate in the previous year, but a decrease of 2·8 in comparison with the average rate for the ten years 1890–99. The admissions comprised 5 cases of bronchial affections, and 1 case each of hæmorrhage of lung, pneumonia and phthisis.

Diseases of the Digestive System caused 27 admissions, equal to a ratio of 51·2 per 1,000, or a decrease in comparison with the previous year's and the decennial average rates of 4·7 and 10·0 respectively. Diarrhœa, mouth and throat affections, dyspepsia and colic were the chief causes of admission.

Diseases of the Lymphatic System contributed 8 admissions, giving a ratio of 15·2 per 1,000, as compared with 31·7 in the previous year and 35·8 the average rate for the preceding ten years. Seven of the admissions were due to inflammation and 1 to suppuration of lymphatic glands.

Diseases of the Urinary System caused 1 admission, due to incontinence of urine, the ratio being 1·9 per 1,000, as compared with 2·1, the ratio in 1899, and 2·0, the decennial average ratio.

Diseases of the Generative System, with 16 admissions, gave a ratio of 30·3 per 1,000, which is below the rate in the previous year by 70·4 and that of the decennial average period by 55·7. In addition to 8 admissions for soft chancre, already referred to under the heading of venereal diseases, the cases included 7 of orchitis and 1 of balanitis.

For *diseases of the organs of locomotion* there were 4 admissions, 2 cases being due to synovitis, and 1 each to periostitis and necrosis of bone. The ratio per 1,000, 7·6, is lower than the ratio for the preceding year and that of the decennial average by 5·5 and ·7 respectively.

Diseases of the Connective Tissue caused 8 admissions, equal to a ratio of 15·2 per 1,000, a decrease of 9·6 as compared with the rate for 1899, and of 14·6 as compared with the decennial average rate.

Diseases of the Skin gave 13 admissions, equal to a ratio of 24·7 per 1,000, and show a decline of 16·0 in comparison with that for the preceding year, and one of 17·8 in comparison with the average rate. Among the cases were 4 of eczema, 3 of boils, and 3 of ulcer.

INJURIES caused 49 admissions, or a ratio of 93·0 per 1,000, which shows, as compared with the previous year's rate, an increase of 10·9, and with the ten years' average rate one of 7·0 per 1,000.

There was no admission for *general injury*, but a death resulted from suffocation from submersion. The man was found dead in the harbour of Singapore, and the coroner's jury returned a verdict of "found drowned." Of the cases of *local injury*, wounds, sprains, and contusions furnished the majority of the admissions.

SURGICAL OPERATIONS.—The only operation of any importance was an operation for necrosis of left parietal bone. Eucaine was the anæsthetic used, and the operation resulted satisfactorily. The patient, who was much debilitated, owing to climate and long residence in hospital, was invalided to England.

INVALIDING.—The number of men invalided home during the year was 23, giving a ratio of 43·64 per 1,000, which is higher than in 1899 by 18·12 and than the average by 25·31. Of the men invalided, 17, or 68·27 per 1,000, belonged to the Artillery, 3, or 20·27 per 1,000, to the Infantry, 2, or 20·00 per 1,000, to the Royal Engineers, and 1, or 33·33 per 1,000, to other corps. With regard to age, 11 men, or 47·01 per 1,000, were between 20 and 25, 9 men, or 43·48 per 1,000, were between 25 and 30, 1 man, or 16·95 per 1,000, was between 30 and 35, and 1 man, or 50·0 per 1,000, was over 35 years of age. As to length of service in the Command, 5 men (in an average annual strength amounting to 11), or 454·55 per 1,000, were in their first year, 6 men, or 24·49 per 1,000, were in their second year, and 12 men, or 54·30 per 1,000, were in their third year. No case of invaliding occurred among men who had over three years in the Command. The causes of invaliding were secondary syphilis 5 cases, enteric fever 3 cases, remittent fever, tubercle of lung and debility 2 cases each, while one each was due to ague, gonorrhœa, rheumatism, dementia, phthisis, typhlitis, soft chancre, necrosis and synovitis.

There were 8 men discharged the service as medically unfit during the year, the ratio, 15·18 per 1,000, being higher than that for the preceding year by 11·73 and than the decennial average rate by 6·17. The causes of discharge were 3 for tubercle of lung, 2 for secondary syphilis, and one each for melancholia, perforation of membrana tympani and synovitis.

OFFICERS.—In an average strength of 35, there were 22 cases of sickness, equal to a ratio of 628·6 per 1,000, as compared with 914·9 in the previous year. The chief causes of admission were ague 5 cases, simple continued fever 4, local injuries 4, and digestive disorders 2 cases. No death occurred, but three officers were invalided to England for influenza, pyæmia and inflammation of liver respectively.

WOMEN.—In an average strength of 41, there were 42 cases of sickness, the ratio being 1,024·39 per 1,000, showing a decrease as compared with the previous year's rate of 308·9 per 1,000; the death ratio was *nil*, as compared with 14·49 in 1899. Among the cases treated were 13 cases of debility, 4 of diseases connected with pregnancy, 3 of neuralgia, and 2 cases each of influenza, simple continued fever, ague, colic, diarrhœa, and whitlow.

CHILDREN.—The average strength was 93, and there were 46 admissions, equivalent to a ratio of 494·62, which is lower than the corresponding ratio in 1899 by 358·1. No death occurred, as compared with 1 in the previous year. The cases included 8 of ague, 6 of digestive disorders, 6 of skin diseases, 5 of bronchial affection, 4 each of simple continued fever, inflammation of lymph glands and local injuries, and 3 cases of dysentery.

VACCINATION.—Of 11 primary vaccinations among the children there were 6 failures, and of 19 re-vaccinations among the men, 7 among the women, and 29 among the children, failure resulted in 10, 1 and 5 cases respectively. Calf lymph obtained from the Veterinary Institute, Saigon, was used, the lymph received from Aldershot having been found useless on arrival in Singapore.

II.—ASIATIC TROOPS.

The force consisted of No. 1 Company of the Hong Kong-Singapore Battalion, Royal Artillery, and the Singapore Company Royal Engineers throughout the year. The 16th Battalion Madras Infantry arrived on 5th

India. in the previous year by ·29 of a day, while the average duration of each case of sickness, 22·58 days, is also shorter by ·30 of a day.

The following table shows, as far as possible, the statistics of sickness, mortality and invaliding among the troops according to age.

Age.	Average Strength.	Admissions.	Deaths.	Invaliding.	Ratios per 1,000 of Strength.		
					Admissions.	Deaths.	Invaliding.
Under 20 years ..	1,370	1,500	13	29	1,094·9	9·49	21·17
From 20 to 25 years	25,689	34,681	401	1,020	1,350·0	15·61	39·71
„ 25 „ 30 „	25,235	28,494	372	779	1,129·1	14·74	30·87
„ 30 „ 35 „	5,480	3,484	68	121	635·8	12·41	22·08
„ 35 „ 40 „	1,500	636	22	52	424·0	14·67	34·67
„ 40 and upwards ..	511	290	9	25	567·5	17·61	48·92
Not stated	768	140	—	—	182·3	—	—
Total ..	60,553	69,225	885	2,026	1,143·2	14·62	*33·46

* Includes 6 invalids discharged in India; excluding these the ratio is 33·36.

As in preceding years the highest admission ratio, 1,350·0 per 1,000, occurred among men of between 20 and 25 years of age, the 25 to 30 years period comes next with a ratio of 1,129·1, and this is followed by 1,094·9 for men under 20 years of age. In the two quinquennial periods, 30 to 35, and 35 to 40 years, the admission ratios fall to 635·8 and 424·0 respectively, rising to 567·5 for men of 40 years and upwards. Compared with the corresponding ratios for 1899, the admission ratios show decreases of 61·8 among men between 20 and 25 years, and 24·6 among men between 35 and 40 years, but increases of 171·9 in men under 20 years, of 92·3 among those between 25 and 30 years, of 98·1 among men between 30 and 35 years, and of 132·2 for men of 40 years of age and upwards. As usual the highest mortality ratio, 17·61 per 1,000, occurred among men of 40 years of age and upwards, but it shows a decrease of 3·94 on the ratio of the previous year. The lowest death rate is observed as in preceding years, among men under 20 years of age, 9·49 per 1,000, being an increase of 1·38 on the corresponding ratio for 1899. In the other age groups, a decrease of 1·10 among men between 30 and 35 years, and increases of 1·13 in the 20 to 25 years group, of 3·59 in the 25 to 30 years group, and of ·09 in the 35 to 40 years group, are observed as compared with the previous year.

The following table shows the influence of length of service in India on the sickness, mortality, and invaliding among the troops :—

Length of Service in India.	Average Strength.	Admissions.	Deaths.	Invaliding.	Ratios per 1,000 of Strength.		
					Admissions.	Deaths.	Invaliding.
Under 1 year	2,892	3,840	56	194	1,327·8	19·36	67·03
1 to 2 years	9,679	13,939	192	462	1,440·1	19·84	47·73
2 „ 3 „	10,360	13,514	160	312	1,307·3	15·44	30·12
3 „ 4 „	9,486	10,749	107	259	1,133·1	11·28	27·30
4 „ 5 „	8,830	8,290	99	230	938·8	11·21	26·05
5 „ 10 „	15,851	17,343	240	494	1,094·1	15·14	31·17
10 years and upwards	2,686	1,380	31	75	513·8	11·54	27·92
Not stated	769	140	—	—	182·1	—	—
Total	60,553	69,225	885	2,026	1,143·2	14·62	*33·46

* Includes 6 invalids discharged in India; excluding these the ratio is 33·36.

It will be observed that the admission rate was highest among men in their second year of Indian service, and, as in preceding years, lowest among men of ten years' service and upwards in the country. The second highest rate was among men in their first year of Indian service, after which the ratios decrease steadily for the third, fourth and fifth years of service, to rise again among men of 5 to 10 years' service in India. Comparing the admission ratios with those of 1899, decreases of 161·4 and 136·2 are observed for men in their first and fifth years of service respectively. Increases are shown among men in their second, third and fourth years' of service, of 161·5, 185·5 and 80·3 respectively, while there is also an increase of 42·4 among men of 5 to 10 years' service, and of 59·6 for men of 10 years' service and over. *India.*

With regard to mortality, the highest death rate was 19·84 per 1,000, for men in their second year of service in India, showing an increase of 6·96 on the ratio for the corresponding period in 1899. When compared with the mortality ratios for the preceding year, the death rate for men in their first year of service is lower by ·93, and for men of ten years' service and over by ·14; all the other groups show higher death rates, the increases being 4·45, 1·37 and 2·75 among men in their third, fourth and fifth years respectively, and 1·54 for the five to ten years period.

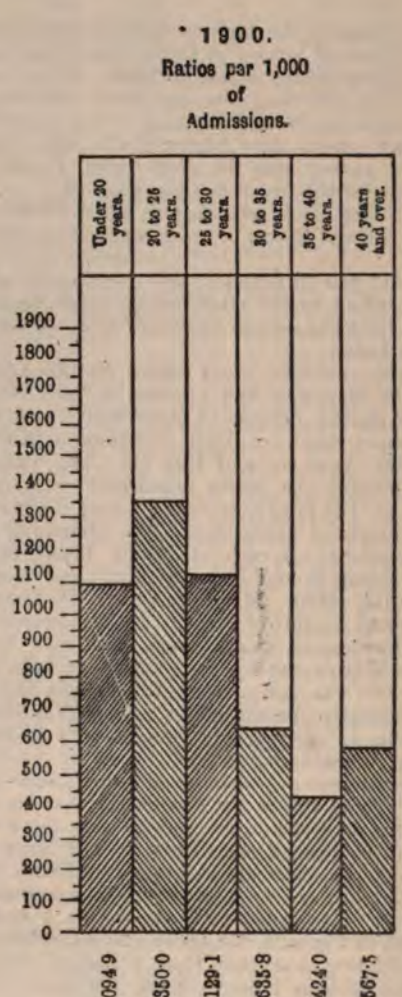
The sickness, mortality, and invaliding at the different ages and periods of service in India, are also shown in the accompanying charts.

In Abstract XVIII will be found a table showing the admissions, deaths, invaliding, &c., according to the classification of diseases, and in Abstract XIX will be found the sickness and mortality from the same in each of the military districts in India.

GENERAL DISEASES.—*Eruptive fevers* caused 93 admissions and 3 deaths, as compared with 139 admissions and 7 deaths in 1899. There were 36 cases of *small-pox* with 3 deaths, against 14 cases with 1 death in the previous year. Ten of the cases with one death occurred at Kamptee during the months of March (4). April (5), and May (1). The disease was prevalent at the same time among the native population of Kamptee and in the surrounding villages. The fatal case was of severe confluent type, although the man bore good marks of vaccination. The remaining cases occurred in the following 17 stations:—3 each at Mhow, Poona and Secunderabad, 2 each at Bombay, Neemuch and Indore (1 fatal), and 1 each at Cawnpore, Agra, Muttra, Delhi, Mian Mir, Amritsar, Peshawar, Poonamallee, Wellington, Kirkee and Nasirabad (fatal). In all instances the men attacked bore satisfactory vaccination marks, some had been revaccinated since enlistment, and the Muttra case had had small-pox before. Direct contact with pre-existing cases was difficult to establish, but the disease was very prevalent among the native population at most of the stations named, and in some instances also in surrounding villages. At Poona it was thought that the disease was probably imported to barracks through the followers. At Neemuch the disease was prevalent among the famine-stricken people in the country round about, and it was considered that small-pox was introduced to cantonments by destitute people who came there in search of food. The patient at Agra contracted the disease in the bazar, while one of the cases at Bombay and the cases at Kirkee and Muttra were regarded as instances of imported disease. One case of *cow-pox* occurred at Kirkee, and there were 11 cases of *chicken-pox*, 4 at Mhow, 2 each at Poona and Sitabaldi, and 1 each at Umballa, Bangalore and Khandalla. *Measles* caused 24 admissions, 7 at Meerut, 5 at Dum Dum, 2 each at Jubbulpore, Rangoon and Quetta, and one each at Benares, Agra, Ferozepore, Dalhousie, Poona and Aden; the first of the Dum Dum cases originated in Calcutta, where the disease was very prevalent among the children in barracks; the disease was also prevalent among the children at Meerut, Ferozepore and Rangoon: and at Quetta as well as prevailing among the children it was also present in an epidemic form among the civil population. There were 5 cases of *rubella*, 2 at Mhow, and 1 each at Lucknow, Dalhousie and Secunderabad. *Scarlet fever.*—There were 8 admissions for this disease, as compared with 83 admissions and 6 deaths in 1899. Six of the cases occurred at Multan and 2 at Quetta; the three first cases admitted at Multan were men who

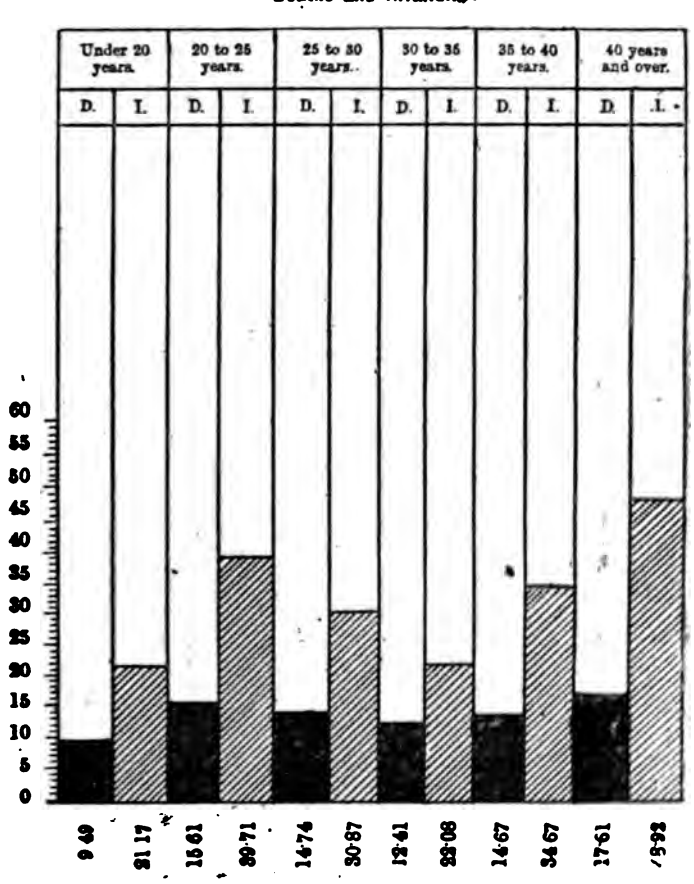
India.

AGE IN RELATION TO SICKNESS,



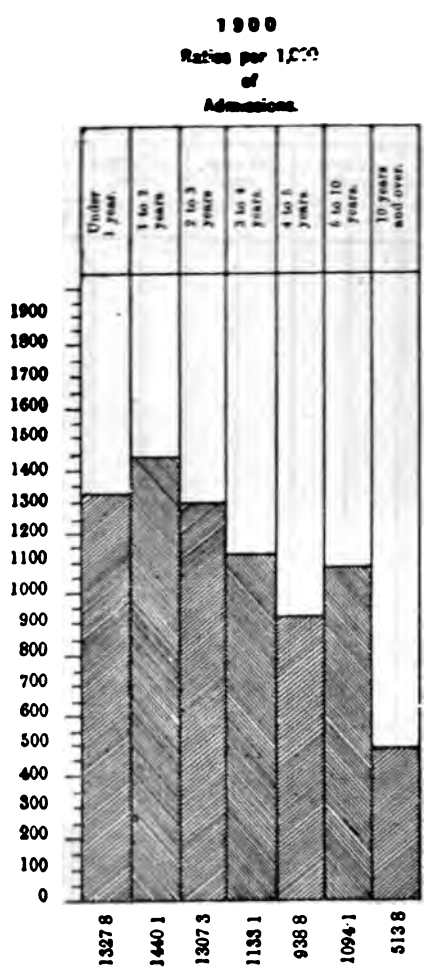
MORTALITY AND INVALIDING. *India.*

1900.
Ratios per 1,000
of
Deaths and Invaliding.



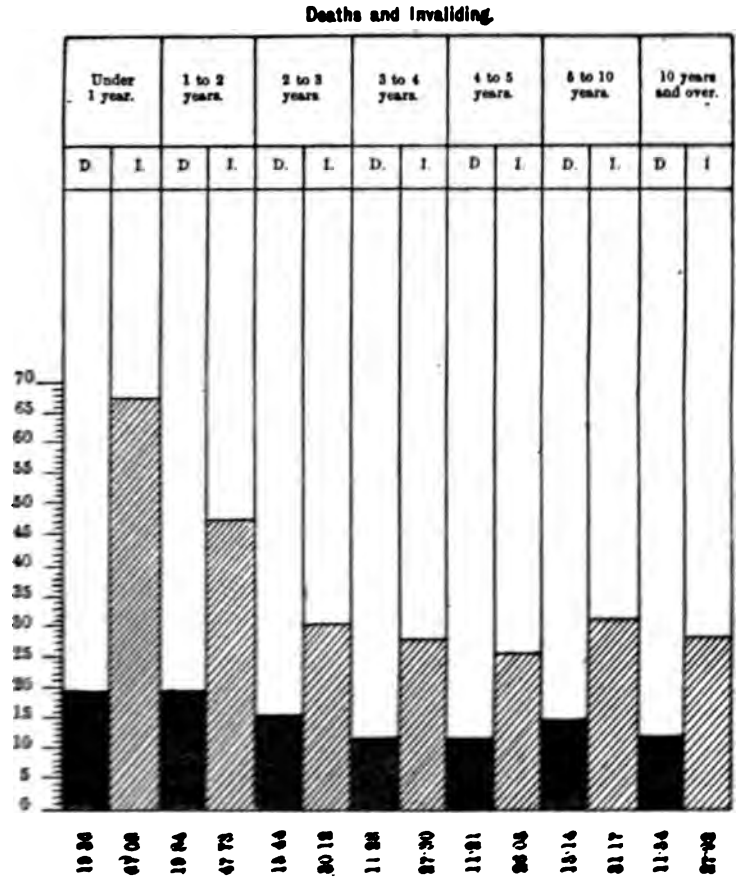
The proportion of this chart to that for admissions is as 20 to 1.

India. SERVICE IN INDIA IN RELATION TO



SICKNESS, MORTALITY, AND INVALIDING. *India.*

1900.
Ratios per 1,000
of
Deaths and Invaliding.



The proportion of this chart to that for admissions is as 20 to 1

India.

had just arrived in India from Dublin, and presumably brought the disease with them, while at Quetta the disease was present at the time among the civil population, but a direct causative connection between the civil and military cases was not traced. *Dengue* caused 8 admissions, 7 at Calcutta and 1 at Poona.

Plague.—There were 6 admissions with 1 death, against 7 admissions and 2 deaths in 1899. Two cases were admitted on the 25th of September at Bangalore, one of the cases being severe, the other mild. Plague was prevalent at the time among the civil population, and in the case of the man who suffered most, the origin of the disease was not difficult to trace, as it appears that up to the date of his admission he had been in the habit of regularly visiting a room in one of the most infected streets. There were two admissions at Belgaum, the first on the 15th, the second on the 20th of September. The men belonged to the East Yorkshire Regiment. Both cases came from the Fort, but from different rooms. The source of infection was not traced; both men denied having been into native houses or having mixed with natives recently. Another man belonging to the East Yorkshire Regiment was attacked when the head-quarters and right wing of the regiment were on the march from Bellary to Madras. In this case, symptoms of plague showed themselves at Anantpur on the 10th of December, the seventh day of the march; it is supposed that the disease was contracted at Belgaum. A fatal case occurred at Aden, the man dying within twenty-hours of the symptoms appearing. The exact source of the disease could not be traced, but plague was prevalent among the native population.

Influenza.—There were 237 admissions and 1 death, as compared with 674 admissions and 1 death in the previous year, being in the ratio of 3·9 and ·02 per 1,000, as compared with 10·0 and ·01 the admission and death ratios respectively for 1899, and 9·8 and ·03 the corresponding decennial average rates. The average number of men constantly sick was 10·07 as compared with 21·68 in the preceding year. The disease was most prevalent in the Bengal Command. The largest outbreak occurred at Barrackpore, where the type of the disease was in many cases very severe. Influenza was imported to this station from Calcutta late in July, and there were 32 admissions in August, 32 in September, and 13 in October, after which the disease disappeared. Elsewhere the disease was of mild type, and the cases presented no features of noteworthy interest. The only other instances of special prevalence were 32 cases at Dum Dum, 27 at Lucknow (including 3 in the military prison), and 13 at Belgaum. The fatal case occurred at Port Blair.

Diphtheria.—There were 3 admissions as compared with none in the preceding year. Two of the cases occurred at Ranikhet; both were admitted from the same barrack-room, there being an interval of thirty-six days between the admissions, but in neither instance could the origin of the disease be traced. The third admission was at Landour, and here again there was nothing to show in what manner the disease had been contracted but at the time there were cases of diphtheria among the native population in the bazar. Two of the cases were exceptionally severe, and in both, treatment with anti-diphtheritic serum was employed with benefit, particularly marked in the Landour case, in which, just before the treatment was commenced, recourse to tracheotomy appeared necessary.

Enteric Fever.—This disease caused 970 admissions, 289 deaths and a constant sickness of 140·70 men, as compared with 1,392 admissions, 348 deaths and an average number constantly sick of 213·20 in 1899. The ratio of admission was 16·0, that of mortality 4·77, and that of constantly sick 2·32 per 1,000. When compared with the preceding year, decrease of 72·50 in the average number of men constantly sick from enteric fever is observed, while the admission, death and constantly sick ratios show decreases of 4·6, ·37 and ·83 respectively, and in comparison with the decennial average rates, there is a decrease in the admission ratio of 7·8, in the death rate of 1·49, and in the constantly sick ratio of 1·11. The percentage of mortality to attack was high, 29·8, as compared with 25·0 in the previous year and 26·3 the decennial average. Enteric fever caused

32·65 per cent. of the total death rate from all causes in the Command, as compared with 40·32 per cent. in 1899. *India.*

In Abstract XXI the occurrence of enteric fever at each station and in each quarter of the year is shown. The third quarter had the largest number of attacks (322) and deaths (100), the second quarter was next with 265 attacks and 85 deaths, and is followed by the fourth quarter with 217 attacks and 62 deaths, while there were 166 attacks and 42 deaths during the first quarter of the year. The percentage of mortality to attack was highest, 32·1, in the second quarter, followed by 31·1, 28·6 and 25·3 in the third, fourth and first quarters respectively. In the preceding year this percentage was highest in the third quarter, followed in order by the fourth, second and first quarters.

The following tables show the admissions and deaths by commands and districts. The statistics for officers, women, and children are included to make the tables complete.

[Commands.	Warrant officers, non-commissioned officers and men.							Officers.		Women.		Children.	
				Ratios per 1,000 of Strength.									
				1900.		1899.							
	Strength.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Bombay ...	15,031	353	101	23·5	6·72	19·6	4·72	8	1	6	3	7	—
Punjab ...	16,133	256	72	15·9	4·46	25·7	6·87	11	3	10	2	5	1
Bengal ...	18,229	239	69	13·1	3·79	23·2	5·65	12	1	3	—	8	1
Madras ...	9,726	117	47	12·0	4·83	12·1	3·04	7	3	3	2	5	2
Troops on the march	1,434	5	—	3·5	—	5·6	—	1	—	—	—	—	—
Total ...	60,553	970	289	16·0	4·77	20·6	5·14	39	8	22	7	25	4
						1899 ...		55	10	18	7	27	2

It will be observed from a consideration of the statistics given in the foregoing table, that there was a large diminution in the admission and mortality ratios for enteric fever in both the Bengal and Punjab Commands, when the ratios are compared with those of the preceding year, and further investigation shows that the decrease of enteric prevalence in these Commands was a general one and not confined to particular stations. The Bombay Command had the highest admission and mortality ratios for the year, the increase in both ratios being chiefly caused by a large outbreak of enteric fever at Quetta. As in preceding years the disease was least prevalent among the troops in the Madras Command. The admission ratio for this Command was almost the same as that for the previous year, 12·0, but the mortality ratio shows increase, 4·83 against 3·04. There was a large decrease in the prevalence of enteric fever at Bangalore, but the admission ratio for the Command was maintained by a serious epidemic at Secunderabad, while the increase in the Command mortality ratio was due to the severity of type of the cases occurring in that epidemic.

India.

Bombay Command.

Districts.	Warrant officers, non-commissioned officers and men.						Officers.		Women.		Children	
			Ratios per 1,000 of Strength.									
			1900.		1899.							
	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Quetta ...	129	29	50·7	11·40	10·8	2·08	1	—	2	—	—	—
Mhow	106	31	35·6	10·40	34·4	9·78	3	1	1	1	2	—
Poona... ...	83	24	22·2	6·43	28·3	4·80	4	—	3	2	4	—
Nagpur ...	13	4	11·7	3·60	10·8	4·48	—	—	—	—	—	—
Bombay ...	8	4	5·0	2·50	13·4	2·68	—	—	—	—	1	—
Aden	6	5	5·4	4·52	6·4	1·83	—	—	—	—	—	—
Deesa	6	3	12·4	6·21	19·1	8·68	—	—	—	—	—	—
Sind	2	1	1·4	·68	6·7	2·02	—	—	—	—	—	—
Total ...	353	101	23·5	6·72	19·6	4·72	8	1	6	3	7	—

Punjab Command.

Rawal Pindi ...	91	20	15·5	3·41	27·3	5·96	3	—	7	—	3	1
Lahore ...	61	17	13·7	3·82	22·7	8·38	2	1	2	1	—	—
Sirhind ...	54	15	16·8	4·67	33·7	6·95	5	2	—	—	2	—
Peshawar ...	50	20	19·2	7·67	19·5	6·84	1	—	1	1	—	—
Total ...	256	72	15·9	4·46	25·7	6·87	11	3	10	2	5	1

Bengal Command.

Oudh	75	15	20·2	4·04	22·5	5·89	4	—	—	—	3	—
Bundelkhand	44	14	16·9	5·38	29·8	7·98	3	1	—	—	1	—
Meerut ...	41	14	12·0	4·09	35·1	8·55	1	—	1	—	1	1
Allahabad ...	34	8	16·7	3·94	22·0	6·29	1	—	—	—	2	—
Rohilkhand ...	20	3	8·0	1·20	19·0	3·54	1	—	2	—	—	—
Presidency ...	15	9	5·4	3·25	7·0	1·48	2	—	—	—	1	—
Narbudda ...	10	6	8·4	5·07	20·4	3·79	—	—	—	—	—	—
Total ...	239	69	13·1	3·79	23·2	5·65	12	1	3	—	8	1

MADRAS COMMAND.

Districts.	Warrant officers, non-commissioned officers and men.						Officers.		Women.		Children.	
			Ratios per 1,000 of Strength.									
			1900.		1899.							
	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths	Admissions.	Deaths.
Secunderabad	77	25	30·3	9·83	16·8	3·14	1	—	2	2	4	2
Belgaum ...	11	7	7·2	4·61	6·8	3·95	—	—	—	—	—	—
Rangoon ...	10	5	7·0	3·51	6·3	2·72	3	1	1	—	—	—
Southern ...	7	3	6·0	2·58	11·1	2·96	1	1	—	—	—	—
Bangalore ...	5	1	7·3	1·46	36·6	7·44	1	—	—	—	1	—
Madras ...	4	5	3·8	4·78	2·7	—	—	—	—	—	—	—
Mandalay ...	3	1	2·2	·74	2·6	·52	1	1	—	—	—	—
Total ...	117	47	12·0	4·83	12·1	3·04	7	3	3	2	5	2

The disease occurred in every district, and in all but the following twenty-six stations :—Fort Fulta, Fort Chingrikal, Lebong, Fort Allahabad, Lucknow military prison, Sitapur, Fatehgarh, Shahjahanpur, Naini Tal, Pachmarhi, Roorkee, Fort Lahore, Sialkot, Khyra Gali, Bara Gali, Kalabagh, St. Thomas' Mount, Cannanore, Ramandroog, Port Blair, Meiktila, Shwebo, Purandhur, Khandalla, Hyderabad, and Sitabaldi.

The highest admission ratio was 50·7 per 1,000 in the Quetta district, as compared with a ratio of 10·8 in 1899. The Mhow district, which was third highest in the previous year, occupies the second place with 35·6, an increase of 1·2 on the admission rate for 1899. The Secunderabad district comes third with a ratio of 30·3, an increase of 13·5 ; but the next highest ratios, 22·2 in the Poona district and 20·2 in the Oudh district, show decreases of 6·1 and 2·3 respectively, when compared with the corresponding ratios in the preceding year. Madras, Nagpur, Rangoon and Belgaum are the only other districts which show admission rates higher than in 1899, the increases being 1·1, ·9, ·7, and ·4 respectively. Nineteen out of the twenty-six districts show decreased admission rates, of which the chief instances are a decrease of 29·3 in the Bangalore district, of 23·1 in the Meerut district, and of 16·9 in the Sirhind district. The lowest ratio for 1900, 1·4 per 1,000, is shown in the Sind district, a decrease of 5·3 on the previous year. The Mandalay district was next lowest with 2·2, a decrease of ·4, followed by 3·8 in the Madras district, an increase of 1·1. Other districts having an admission ratio of under 10 per 1,000 were Bombay (5·0), Aden (5·4), Presidency (5·4), Southern (6·0), Rangoon (7·0), Belgaum (7·2), Bangalore (7·3), Rohilkhand (8·0), and Narbudda (8·4).

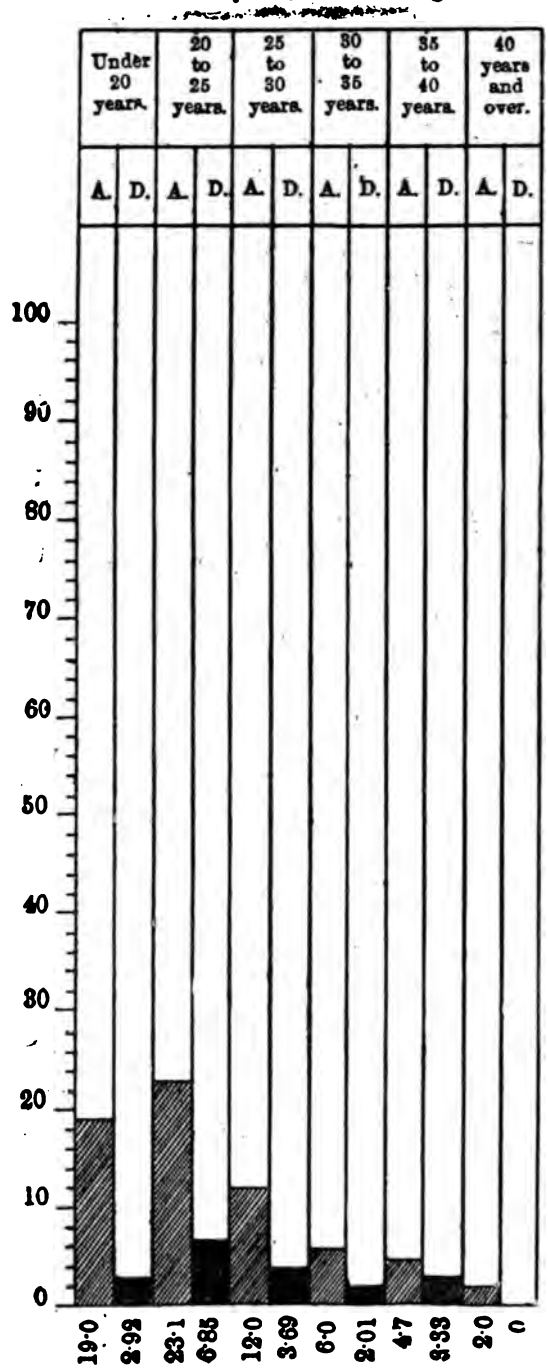
The highest mortality ratio was 11·40 per 1,000 in the Quetta district, an increase of 9·32 on the death rate of the preceding year. The Mhow district, which had the highest death rate from enteric fever last year, comes next with 10·40, an increase of ·62, and this is followed by a ratio of 9·83 in the Secunderabad district, an increase of 6·69. The lowest death rates were ·68 in the Sind district, a decrease of 1·34 ; ·74 in the Mandalay district, an increase of ·22 ; 1·20 in the Rohilkhand district, a decrease of 2·34 ; and 1·46 in the Bangalore district, a decrease of 5·98. Twelve districts show higher death rates than in 1899, of which the chief instances have already been

tia.

1900.

AGE IN RELATION TO CASES OF ENTERIC FEVER.

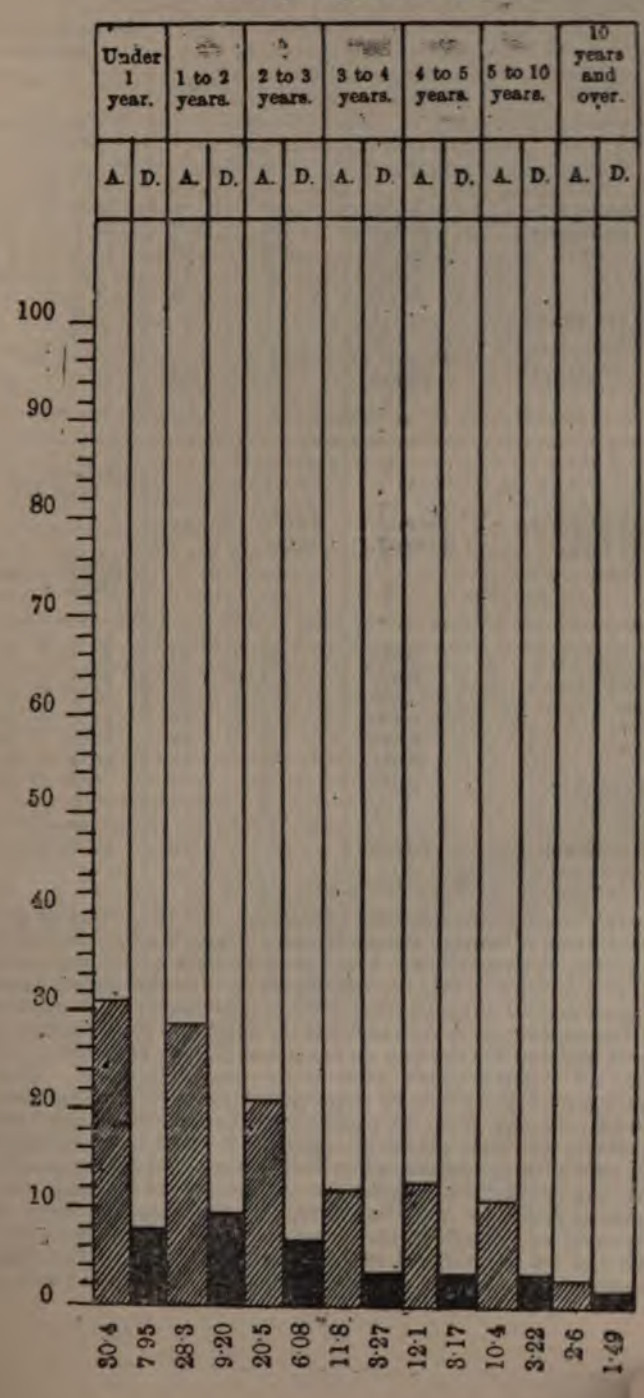
Ratios per 1,000 of strength.



1900.

SERVICE IN INDIA IN RELATION TO CASES OF ENTERIC FEVER.

Ratios per 1,000 of strength.



mentioned, while decreased mortality is observed in fourteen districts, the only instances requiring notice, other than the Bangalore district already referred to, being a decrease of 4·56 in the Lahore district and of 4·46 in the Meerut district.

The following tables and accompanying charts show, as far as possible, the influence of age and service in India on the incidence of the disease :—

Age.	Average Strength.	Admissions.	Deaths.	Ratios per 1,000 of Strength.	
				Admissions.	Deaths.
Under 20 years	1,370	26	4	19·0	2·92
From 20 to 25 years ..	25,689	594	176	23·1	6·85
„ 25 „ 30 „ ..	25,235	304	93	12·0	3·69
„ 30 „ 35 „ ..	5,480	33	11	6·0	2·01
„ 35 „ 40 „ ..	1,500	7	5	4·7	3·33
„ 40 and upwards ..	511	1	—	2·0	—
Not stated	768	5	—	6·5	—
Total ..	60,553	970	289	16·0	4·77

Length of Service in India.	Average Strength.	Admissions.	Deaths.	Ratios per 1,000 of Strength.	
				Admissions.	Deaths.
Under 1 year	2,892	88	23	30·4	7·95
1 to 2 years	9,679	274	89	28·3	9·20
2 „ 3 „	10,360	212	63	20·5	6·08
3 „ 4 „	9,486	112	31	11·8	3·27
4 „ 5 „	8,830	107	28	12·1	3·17
5 „ 10 „	15,851	165	51	10·4	3·22
10 years and over ..	2,686	7	4	2·6	1·49
Not stated	769	5	—	6·5	—
Total ..	60,553	970	289	16·0	4·77

Age.—The usual fact comes into prominence that the period of greatest liability to attack is between 20 and 25 years of age, but the admission ratio for the period, 23·1 per 1,000, is lower than in 1899 by 8·2, lower than in 1898 by 30·2, and lower than in 1897 by 21·3. The diminished admission rate for what may be called the period of special enteric prevalence is of the greater interest, when it is observed that the admission ratios for men under 20 years of age, and for the two quinquennial periods, 25 to 30, and 30 to 35 years, are slightly higher than in the preceding year. Thus the admission ratio for the under 20 years period was 19·0, as compared with 18·8 in 1899; for the 25 to 30 years period it was 12·0 against 11·5, and for the 30 to 35 years period 6·0 against 5·8. Although the admission rates for these three periods show little change when compared with 1899, yet they show very considerable diminution when compared with the admission ratios for 1897 and 1898, the corresponding ratios being, taking periods in question in the order named in the previous sentence, 33·0, 19·6 and 7·6 in 1897, and 24·7, 22·2 and 9·0 in 1898. The admission ratio among men of 35 to 40 years of age was 4·7, as compared with 2·0 in

1899, 4·2 in 1898 and 3·0 in 1897. There was 1 admission for men over 40, giving a ratio of 2·0 per 1,000, against no admission in the previous year. The mortality ratio was highest, 6·85 per 1,000, among men of 20 to 25 years of age, followed by 3·69 for the 25 to 30 years group, 3·33 among men of 35 to 40 years, 2·92 for men under 20, and 2·01 among those between 30 and 35 years of age. In the order of groups just given the mortality rates in 1899 were 7·74, 3·04, 1·33. 3·04 and 2·14 respectively. *India*

Service.—The highest admission ratio, 30·4 per 1,000, occurred as in preceding years among men of under one year's service in India, a decrease of 21·2 on last year's rate, while it is no less than 61·1 below the corresponding ratio for 1898. The next highest admission rate was 28·3 for men in their second year in India, a decrease of 2·0 as compared with the preceding year. This is followed by a ratio of 20·5 for men in their third year, 11·8 for those in their fourth year, 12·1 among men in their fifth year, and 10·4 among men of the five to ten years period; all these ratios are higher than in 1899, the increases being in the order given above, 8·9, 1·1, 3·9 and 1·6 respectively. The mortality ratio was highest, 9·20 per 1,000, among men in their second year of Indian service, as compared with a death rate of 7·71 last year for the corresponding group. The mortality rate for men of under one year's service in the country was 7·95 against 11·47 in 1899. The other mortality ratios were 6·08 among men in their third year, 3·27 among those in their fourth year, 3·17 among men in their fifth year, and 3·22 among men who had served in India between five and ten years. These mortality rates are all higher than in 1899, the increases being respectively 3·01, ·21, ·72, and ·24.

In the last annual report a large diminution in the prevalence of enteric fever during 1899 was recorded. A further decrease of enteric prevalence is observed for the year under review, and with this decrease a lessened death rate is associated. The admission ratio for the year was 16·0 and the death rate 4·77 per 1,000, as compared with 20·6 and 5·14 in 1899, while both ratios are also lower than for any year since 1888, in which year the admission rate was 13·6 and the death rate 3·77 per 1,000.

The special liability of the young soldier to contract enteric fever in the first year of his service in India, is observed with unfailing regularity year after year, and without doubt, a considerable part of the decrease in the actual number of admissions for enteric fever in 1900, as compared with the immediately preceding years, was due to the absence of individuals specially susceptible to the disease, as owing to the suspension of trooping only a few small drafts of men came into the country during the year. Thus the number of cases of enteric fever which occurred among men of under one year's service in India was 88, as compared with 621 in 1899, 1,057 in 1898, and 817 in 1897. Although a lessened number of cases means a proportionately lessened possibility of dissemination of the disease germs, still the admission ratio for the under one year period, 30·4 per 1,000, shows such a large decrease when compared with the admission ratios for the corresponding period in 1899 and 1898, namely, 51·6 and 91·5 respectively, as to render it almost certain that part of the diminution observed for the year was a real decrease of enteric prevalence due to more satisfactory causes than the mere absence of susceptible men. The latter assumption readily enough accounts for a decrease in the actual number of cases, but the very large diminution in the admission ratio is more difficult to explain. Had the chances of contracting enteric fever remained the same as in the previous year, then, out of the 2,892 men belonging to the under one year period in 1900, the number of cases should have been 149 instead of 88, while calculated according to the ratio of enteric prevalence in 1898, the number of cases which occurred in that year among an equal number of men belonging to the same period works out to 264, exactly three times the number of 1900. The admission ratio for men in their second year of Indian service is also lower than in 1899, 28·3 against 30·3, and considerably lower than in 1898, 28·3 against 38·9. There has, therefore, been a decrease of prevalence of enteric fever among the men most susceptible to it. The decrease is the more satisfactory, inasmuch as two large outbreaks of the disease have to be recorded for the year, one at Quetta and the other at Secunderabad; and moreover, the diminution in 1899 was associated with a greatly lessened

prevalence of malarial and other debilitating diseases, which are usually regarded as powerful predisposing causes, whereas in 1900, the further decrease of enteric prevalence occurred notwithstanding an abnormal increase of malarial fever with its accompanying debility. No certain statements can be made with regard to the causation of the decrease in the admission ratio, suggestions only can be offered, such as improved sanitation generally and increased attention to water supply and disposal of nightsoil particularly, inoculation and continued absence of field service, &c. Time alone will show whether, with the usual influx of susceptible individuals, the diminution of enteric prevalence will be of a permanent character or not.

The following are the chief points which have been noted during 1900 in connection with the causation of enteric fever in India.

Water.—The bacteriological examinations which have been carried out during the year have added little of a positive character to our knowledge of the etiology of enteric fever as it occurs in India. The examinations of the drinking water at Quetta (129 admissions), made by independent observers, yielded negative results, and the same is true of the examinations of the water supply made weekly throughout the year at Lucknow (63 admissions). At Agra (19 admissions) samples of water from three stand-pipes and from the wells in the British Infantry barracks were examined weekly by Mr. Hankin with the following results:—The results were negative throughout the year as regards the well water, which is the drinking supply for all the British troops in Agra. The *bacillus typhosus* was detected in a sample from No. 43 stand-post, and in water from the River Jumna in May; and in a sample from the same stand-post in July, and from No. 53 stand-post in November, but on those two occasions the bacillus only reacted feebly to typhoid serum. In 13 samples of municipal pipe water from stand-posts in cantonments and in 12 samples from the lines occupied by the 50th Battery, Royal Field Artillery (this battery furnished six of the cases), a microbe having some of the cultural characters of the enteric bacillus was found, but it did not react to typhoid serum and gave a yellow growth on potato. A sample of water from the 20th Hussar lines at Mhow, examined by the same observer, was reported to contain a bacillus resembling the enteric bacillus. At Meiktila, where no cases of enteric fever occurred during the year, the *bacillus typhosus* was isolated in June by Widal's method from the lake water. The water from a spring at Chakrata (13 admissions) was examined by Mr. Hankin on three occasions, and the *bacillus coli communis* was found to be present in August and November, but it was absent in September. Liability to contamination either at the source or during distribution is alluded to in several reports, and in all instances the danger of pollution is from the *native* population. The chief sanitary defect at Rangoon is considered to be the water supply, and artesian wells are recommended. Two stations, Secunderabad and Nasirabad, which come into special prominence on account of the prevalence of enteric fever during the year, have a dual water supply. Precautions are taken to ensure the purity of the drinking water at both stations, but on account of the insufficiency of this supply, water from a doubtful source has to be used for ablution and washing purposes. The "pakhal" carriage of drinking water is referred to as a possible source of the disease at Kasauli and Ranikhet. Enteric fever may be contracted in many instances through the men drinking contaminated water outside barracks, as for instance in the bazars, from irrigation canals as in a few of the cases at Quetta, from a stream in the hills as in a case at Solon, from swallowing water while bathing in a tank as reported in a case admitted at Satara, and while out shooting as in cases reported from Deesa (2), Ahmedabad (1, fatal), and Shwebo (1, an officer, fatal).

Not a few stations attribute their freedom from enteric fever to the purity of their water and food supplies, and at nearly every station in India, to safeguard the men from water-conveyed enteric, all drinking water is sterilized by boiling, and is treated when cool with permanganate of potash, while every care is taken to ensure the absolute cleanness of all vessels in which drinking water may be conveyed or stored. In some instances these precautions may fail, either from the sterilization being carried out carelessly, as reported in one instance from Agra, or from

faulty storage permitting the ingress of infected dust or flies, as mentioned in the Poona and Nasirabad reports, or from the men themselves deliberately making use of other water for drinking purposes. *India.*

Aerated Waters.—Bazar-manufactured aerated waters are mentioned as being the probable source of the disease in two cases at Meerut, in one case at Calcutta and in one at Bhamo.

Milk.—In two out of the six cases which occurred at Dagshai the origin of the disease was attributed to the men having been in the habit of drinking milk which they obtained from an unlicensed hawker in barracks, who had been excluded from the lines previously on account of the filthy state of his cow-houses, and other irregularities. In the case of a small outbreak at Subathu, it is stated that admissions for enteric fever ceased 14 days after orders were issued to have all milk boiled before being sold or made into butter. No direct evidence, however, is given pointing to the possibility of milk contamination, except that the ordinary supply, which was considered good, was supplemented from a dairy kept by a native, and milk from the surrounding country was being sold.

Soil pollution.—The pollution of the surface and upper layers of the soil, which, from the habits of the native and his extensive use of excreta as manure, occurs everywhere in India, and which becomes concentrated wherever natives are aggregated into communities, as in towns, villages, and cantonment and regimental bazars, and the deliberate pollution of the soil, which results from filth trenching in localities where the subsequent rapid cultivation of the surface cannot be carried out from scarcity of water, as well as the danger which arises from the filth trenches being situated in too close proximity to, or to windward of, inhabited dwellings, must all be regarded as potent factors in the spread of enteric fever, while this view is one that explains to a large extent the endemicity of the disease in military stations in India. The dissemination of the enteric poison is probably brought about in two ways. First, in times of flood following heavy rainfall, surface filth may be washed into water-courses or other sources of water supply, or disease germs may find their way into water supplies by a too rapid percolation of the flood rains through a porous soil, with the failure in consequence of natural filtration, to some extent permitting the passage of some at least of the pathogenic organisms which may have been present in the upper layers of the soil, as witness the constant association of the prevalence of enteric fever with the monsoon period at many stations in Bombay and Madras, a prevalence which attains its maximum intensity towards the close of the rains. Second, as the result of opposite conditions prevailing, an infected soil may dry, crumble, and become converted into dust, and the infected dust being dispersed and carried by the winds, the enteric bacilli find their way into the human body, either through being breathed, or by the dust infecting water, milk, or food. In the Goulstonian Lectures for 1900 on "The Typhoid Bacillus and Typhoid Fever," Horton-Smith states (page 19):—"If, too, we remember that the bacillus has great power of resisting the effect of desiccation, remaining alive, it may be, for over a year in the dried condition (Schiller), it becomes easy to understand how bacilli eliminated from the body may later pass into the atmosphere in the form of dust and cause disease at long periods after every fresh source of infection has been really removed." The common occurrence of enteric fever at stations where dust-storms are prevalent, or where the prevailing wind may carry infected dust to barracks by first passing over collections of nightsoil, such as filth trenches (Quetta, 1898, and Ahmednagar, 1899), or municipal filth depôts (Bangalore, 1899), has often been observed. The Quetta epidemic of 1898 was regarded as wind-borne in this way, and Major Davies, R.A.M.C., in his special report on the Quetta outbreak of 1900, arrives at the conclusion that infected dust dispersed by the winds was again the most probable explanation (see remarks on enteric fever at Quetta). As favouring the air convection theory may be cited the fact, that the period of greatest prevalence of enteric fever at most Bengal and Punjab stations, is just when the weather is beginning to get uncomfortably hot, before the rains, and when one of the commonest conditions is the prevalence of dust. Again, at Bangalore it was observed that the disease was ordinarily most pre-

India.

valent in the artillery and cavalry barracks, and that it prevailed most in the rooms of these barracks which were placed nearest the horse lines, and nearest a municipal depôt for nightsoil and an open sewer, both situated to windward of the rooms in question. The number of admissions during the year at this station was five, with one death, against fifty-nine admissions and twelve deaths in 1899. The following remarks by the officer in charge of the Station Hospital, Bangalore, are therefore of interest as bearing on the question of the air convection of the disease :—

"Until this year, since March, 1895, we had never been without cases in hospital. From June 19th to August 13th no case was under treatment, and again from September 25th up to the end of the year cases were absent. The marked decrease in the ratio is most satisfactory, and is probably due to more causes than one. The main cause is probably the decrease in the supply of young soldiers of the enteric age from home during the past year, owing to drafts for the troops in Bangalore having practically ceased. But I think also a certain amount of credit must be given to the sanitary steps referred to in last year's Medical Transactions, as a result of which I venture to prophesy a steady diminution in the ratio of cases to strength from about August, 1899. Further steps leading to the same pleasing result were, in my opinion, the vacating of the barrack-rooms next the horse lines in the case of the 4th Hussars and 25th Battery, Royal Field Artillery. The squadron of the former left in Bangalore was removed into the barrack-rooms farthest away from the lines, and opportunity was taken in the case of the 25th Battery of removing the men from their own barrack-rooms to those previously occupied by J Battery, Royal Horse Artillery.

"I may here recapitulate these steps :—

"1. Closing the nightsoil depôt to windward of the barracks.

"2. Discontinuing the irrigation of the lucerne gardens with liquid sewage.

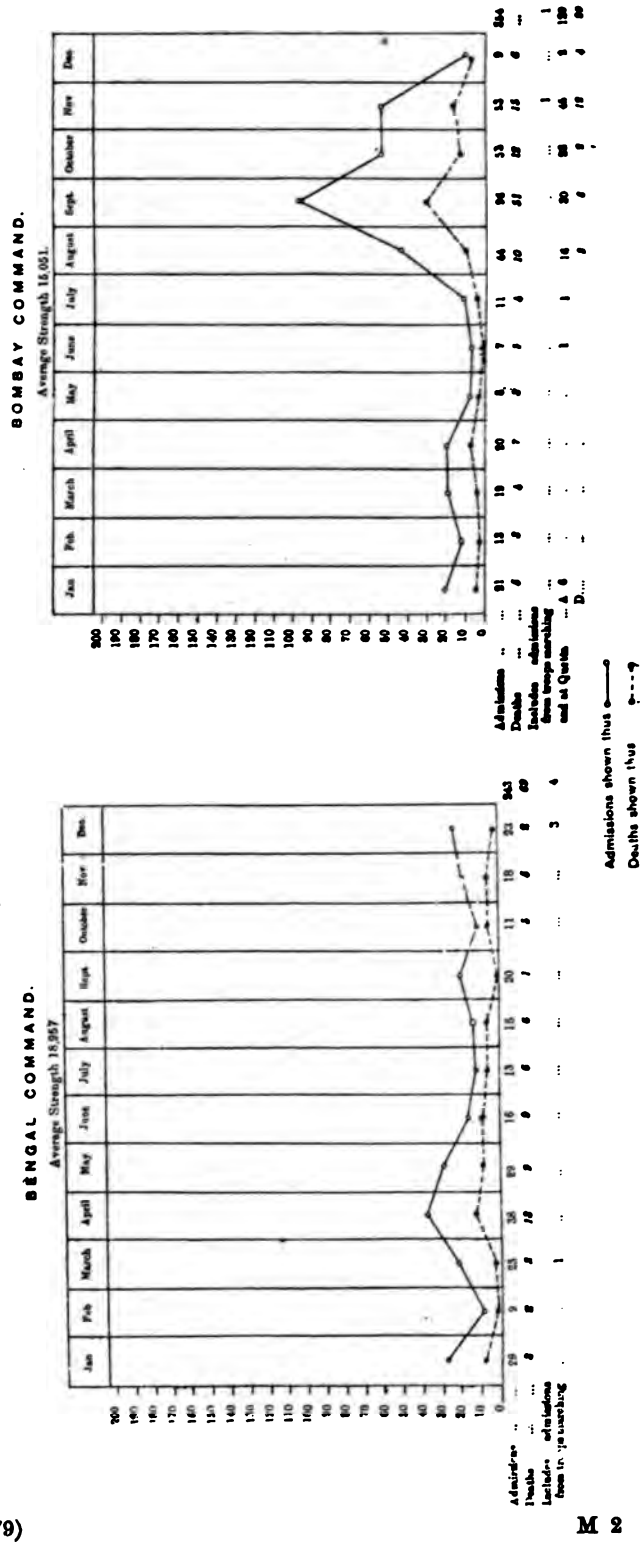
"3. Removal of the men as opportunity arose from barrack-rooms previously noted as supplying the majority of the cases in other years."

Latrines, &c.—Flies.—The infection of latrines by ambulant cases of enteric fever, the carelessness of men in failing to make use of the dry earth provided in the latrines, the carriage of infected stools and urine in the filth carts and their transference to the filth trenches, are all referred to in various reports. The swarming of flies in latrines, at filth trench sites, and, in fact, wherever collections of filth are to be found, is also pointed out in connection with flies being probable carriers of enteric bacilli. Faulty situation of latrines in relation to cookhouses, is mentioned in the reports from Poona and Ahmednagar. Flies and dust are considered to be more important factors in disseminating the enteric poison at Lucknow than the possibly contaminated water supply. Flies are reported to have been prevalent to a troublesome degree during the height of the outbreaks of enteric fever at Secunderabad. The "Crowley" carts are considered to be a source of danger at Nasirabad, partly by bringing flies from the filth trenches into barracks, as in consequence of the deficiency of water it is impossible for the carts to be always cleaned out at the trenches on each journey. The infection of urinals by ambulant cases, and by men who have been returned to duty after enteric fever, with the possible infection of the ground by urine, is brought to notice. At Calcutta and Agra the urine receptacles are washed out at intervals with a perchloride of mercury solution ; while in hospitals as much attention is beginning to be paid to the safe disposal of the urine of enteric patients as is given to the disposal of the stools.

Importation.—As in preceding years it is commonly reported from the hill stations, that most of the enteric patients contracted the disease during the march up or at their former stations. Some of the admissions at stations in the plains were also regarded as instances of imported disease. In one case admitted at Aden, the patient was transferred from the s.s. "Hawarden Castle," and the disease was contracted in Egypt.

Bazars.—A bazar source for the disease is assigned in many reports, the reasons given being chiefly, filth pollution of the soil and defective sanitation generally, polluted water and food supplies, suspicious aerated waters, sweetmeats, &c. Several cases are reported in which men admitted

SEASONAL PREVALENCE OF ENTERIC FEVER IN INDIA DURING 1900.



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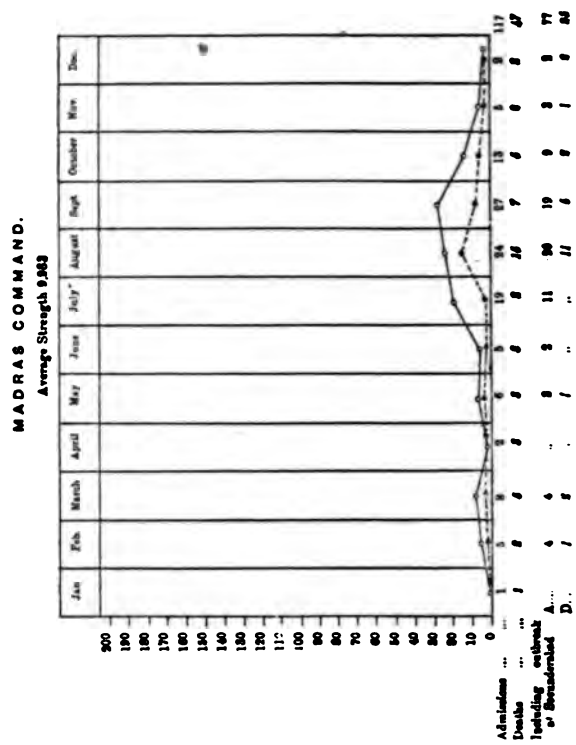
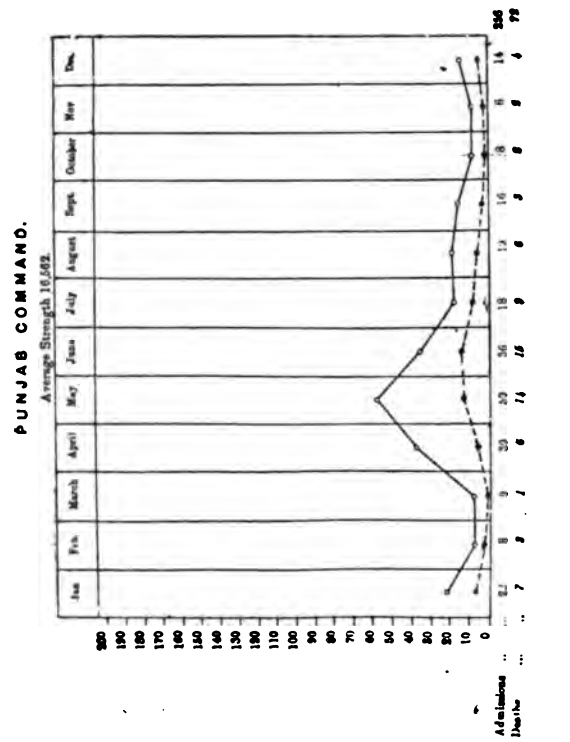

MADRAS COMMAND.
Average Strength 9,963
Jan
Feb.
March
April
May
June
July
August
Sept.
October
Nov
Dec.
Admissions
Deaths
Including outbreak of Bereavement
A....
D....


PUNJAB COMMAND.
Average Strength 16,662
Jan
Feb.
March
April
May
June
July
August
Sept.
October
Nov
Dec.
Admissions
Deaths

for venereal disease developed enteric fever shortly after admission. Two such cases occurred at Rangoon; a man admitted for gonorrhœa at Benares developed enteric fever a few days later; in a case at Belgaum, the patient was admitted for primary syphilis on the 29th of June, enteric fever supervened on the 15th of July and proved fatal on the 10th of August; and in another case at Taragarh, the disease was changed from soft chancre to enteric fever ten days after admission, while a man admitted at Neemuch for enteric fever was found to be also suffering from venereal sores.

Enteric Fever among Natives of India.—The possibility of the occurrence of enteric fever among natives of India has long been a disputed point. The fact of its undoubted occurrence is now acknowledged. It is regarded as somewhat rare, but the statistics on which this opinion is founded deal only with the cases occurring among the native troops and jail prisoners, both classes of natives being men living under good sanitary conditions, the jail prisoner compulsorily so, while he is at the same time cut off from most outside sources of the disease. Exact information is wanting with regard to the nature of the fever that occurs among the ordinary native population, and which can give rise to death rates like 40·60 per 1,000 as occurred at Nasirabad in 1900, while at the same place there was a death rate of 21·47 per 1,000 from bowel complaints, and the total death rate from all causes reached the very high figure of 104·06 per 1,000 (see table given in the special remarks on enteric fever at Nasirabad). Other instances of high death rates from *undefined* fevers were observed among the civil population statistics, some higher than those quoted, but this station was selected as an example because it shows the highest ratio of enteric prevalence among British troops for the year. In connection with this subject the following instances of enteric fever occurring in two native followers are of interest. At Khyra Gali a native follower was admitted for enteric fever, the origin of which could not be traced, and a native follower who was nursing the case contracted the same disease in hospital. Both recovered.

Direct Infection.—Several men, who were employed as nursing orderlies over enteric cases, contracted the disease. Cases of this kind occurred at Dum Dum, Meerut, Peshawar, Rawal Pindi, Nasirabad, Quetta, and Rangoon. Three men contracted enteric fever at Rangoon, while in hospital under treatment for other ailments. Every effort was made to trace the origin of the disease, but without success, and the medical officer in charge finally arrived at the opinion that the disease was due to actual infection from cases previously admitted. Two cases at Quetta, two at Meerut and one at Nasirabad were also instances of men who had been patients in hospital for considerable periods before being attacked by enteric fever.

Seasonal Prevalence.—The accompanying charts show the monthly prevalence of enteric fever among the British troops in India during 1900, and its distribution in the four Commands. The seasonal prevalence in each Command is very much the same as that of the preceding two years. It is observed that the disease is most prevalent in the first half of the year in the Bengal and Punjab Commands, while most cases occur in the second half of the year in the Bombay and Madras Commands. As in preceding years the period of maximum prevalence was in April for Bengal and in May for the Punjab; but, differing from last year, the disease was at its highest prevalence in the Bombay Command in September instead of August, and in July, August, and September in the Madras Command instead of in June and July. The charts for Bengal and the Punjab show the same three periods of special prevalence as in the two previous years. First, with the commencement of the hot weather the disease began to show largely increased prevalence, reaching its highest point for the year in April in Bengal stations, and a month later in the Punjab; and as usual the increase began in February in Bengal, and in March in the Punjab. The customary decrease in June and July is observed for both Commands, but the fall is not so abrupt as it was in 1899. The second period of prevalence is not so well marked as usual for either Command, but it occurred in the same months as in previous years. It began in August in Bengal, reaching its highest point in September, and falling again in October. In the Punjab the second increase is usually a small one in August, with a fall in September and

October, but this year the increase is scarcely marked at all. The third period of increased prevalence began, as is customary, in November, and continued through December into January in both Commands. In Bombay and Madras enteric prevalence bears a close relation to the monsoon period, beginning in July, with the maximum prevalence in August and September. This year enteric fever continued prevalent longer than usual in the Bombay Command; the customary large fall in October being deferred till the end of November, but most of the November admissions formed part of the epidemic at Quetta. The special prevalence of enteric fever during July, August, and September in the Madras Command was for the most part due to the Secunderabad outbreak. *India.*

A large decrease of prevalence is observed for the Bengal hill stations, the total number of cases admitted during the year being 29, with 2 deaths, against 116 admissions and 17 deaths in 1899; the largest number of admissions in any one month occurred in August (7). As in the previous year enteric was most prevalent in May in the Punjab hill stations, but here again a large decrease is observed, the total number of admissions being 80, with 19 deaths, as compared with 149 admissions and 28 deaths in 1899.

The largest outbreak of enteric fever which occurred during the year was at Quetta, where, with an average strength of 2,543, there were 129 admissions with 29 deaths, as compared with 26 admissions and 5 deaths in 1899.

The admissions and deaths by corps and months were as follows:-

	Royal Garrison Artillery.		2nd Suffolk Regiment.		1st Wiltshire Regiment.		Totals.	
	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
January	—	—	—	—	6	—	6	—
February	—	—	—	—	—	—	—	—
March	—	—	—	—	—	—	—	—
April	—	—	—	—	—	—	—	—
May	—	—		—	—	—	—	—
June	—	—	1	—	—	—	1	—
July	—	—	—	—	1	—	1	—
August	1	—	11	2	4	1	16	3
September	3	1	12	4	15	3	30	8
October	—	—	15	1	13	1	28	2
November	2	—	27	7	16	5	45	12
December	1	—	—	2	1	2	2	4
Totals	7	1	66	16	56	12	129	29

The admission and mortality ratios were respectively 50·7 and 11·40 per 1,000. These figures represent a serious outbreak, but not so severe as the Quetta epidemic of 1898, when the average strength of the British troops in garrison for the year was 2,138, and there were 232 admissions with 75 deaths from enteric fever, giving an admission rate of 108·5 and a death rate of 35·08 per 1,000. The period of seasonal prevalence of enteric fever at Quetta is from July to November. This is well shown for the year under report in the foregoing table, and it was also the case with regard to the comparatively small number of admissions which occurred last year, while the same fact is true of the large epidemics of 1896 and 1898. The greatest prevalence of the disease in the 1898 epidemic occurred in July, August, September, and October (204 out of 232 cases), and a somewhat similar prevalence was observed in the epidemic outbreak of 1896. It will be observed from the tabulated statement of cases that this year's outbreak

India. was at its worst between August and November (119 admissions, 25 deaths), and that the highest admission and death rates occurred in the latter month.

The first six cases were admitted between the 7th and the 16th of January. They all belonged to the fifes and drums of the Wiltshire Regiment, and the disease was attributed to a dinner they had on Christmas-day, when most of their food and all their drinks were bought in the Quetta bazar. There were then no other cases in barracks or cantonments, nor did any occur till long afterwards, but it was stated that cases of fever existed at the time among the civil population, the symptoms of which closely resembled those of enteric fever. The one point in common about the six cases in question is the Christmas dinner. Another case which had no connection with the epidemic, was that of a man who reported sick on the morning following his arrival at Quetta from Poona, where he had been stationed for six months. He stated that he had been feeling ill before he left Poona, and he died on the ninth day after admission in an advanced stage of the disease.

Excluding these cases, the outbreak consisted of 122 admissions resulting in 28 deaths. Unlike the epidemic of 1898, the disease was confined almost exclusively to the men; there was only one case among the officers, and one among the women. The Suffolk Regiment suffered most, 65 cases with 15 deaths (excluding the case where the disease was contracted at Poona); the Wiltshire Regiment furnished 50 cases and 12 deaths (excluding the 6 cases in January); while among the three batteries of artillery there were only 7 cases and 1 death, and it is of interest to note that the artillery were entirely free from enteric fever in 1899—a striking contrast to the state of things in 1898, when they had 35 cases. The small number of cases amongst the Royal Artillery and in the left British Infantry lines in 1900, compared with the severe prevalence in these lines in 1898, is presumptive proof that the cause of the 1898 epidemic was, as then suspected, conveyance of the poison from the filth trenches on the north-west of the station by wind and dust. That particular danger has entirely ceased since November, 1898, and it is satisfactory to be able to report that the barracks that formerly suffered most have since that date hardly returned any cases.

The average age of the men attacked was 23·83 years; the two youngest were 15 and 16 years of age, the next youngest was 21, and the two oldest were 33 and 39. The average service in the country was 2·75 years, the shortest period being 3 months and the longest 11 years. Nearly all the men were of regular habits, 73 were temperate but non-abstainers, 45 were total abstainers, and 11 were intemperate. The manner in which the men had been employed throws no light on the causation of the outbreak, but in one case the patient had been a hospital orderly. Two of the cases, when attacked, were in hospital under treatment for other diseases. In two instances the men had had enteric fever previously, both in the 1898 epidemic, and one of them, whose first attack had been a severe one, died from hæmorrhage on the eighteenth day after admission; the other recovered. With regard to previous inoculation, two of the men had been inoculated twice (in June, 1899, and April, 1900, in each instance); one was a mild case, the other rather a severe one, but both recovered; another man, who had been inoculated once only (27th March, 1900), had a fairly severe attack, but also recovered.

Eight men owned to having drunk water from irrigation channels, or other streams, or in the bazar, and 9 other men acknowledged having drunk water other than that supplied regimentally when out at manœuvres. Seven of the men had partaken of aerated waters in the bazar in addition to the regimental supply. Only 9 drank freely of milk, the remainder using it only with their tea, or not at all, and, in all instances, solely the milk supplied regimentally.

After the epidemic of 1898, a special sanitary officer was appointed at Quetta whose sole duties have been to look after sanitation generally, and all the precautionary measures which were taken during the two previous years have been carried out, with perhaps even greater vigour than ever, during the year under report, under his immediate supervision. The causation of the outbreak has been exhaustively investigated by the local authorities, as well as by the special sanitary officers (Majors Davies and

Elliott, R.A.M.C.) who were sent to Quetta for the purpose, and the following were the chief points brought to notice as the result of their inquiries :— *India.*

1. The barracks and cantonment are reported to be models of tidiness and cleanliness, and the general sanitary condition of the lines to be extremely good as regards cookhouses, latrines for European troops, regimental institutes, &c. The surface drainage of the lines has been improved, but much still requires to be done, as when rain does fall it lies, or may lie, in some places for a considerable time.

2. The water supply is described as excellent, the service reservoirs in which it is stored are now well protected from dust, and the water is now laid on in pipes direct to all barracks and cookhouses. Some defects were discovered in some of the joints and connections of the pipes that had been recently laid, but no evidence of contamination of the water in consequence is forthcoming. A second main supply pipe is required, as the amount of water delivered by the present 7-inch main is, as stated in previous reports, insufficient for all purposes, so that there is a scarcity of water for flushing, watering the roads, and cultivation, and this is more especially the case during the hot weather, when it is most wanted. Mr. Hankin made a bacteriological examination of the water in September, samples being taken from both Right and Left lines, and he reported that no microbe resembling that of enteric fever was detected ; and at subsequent bacteriological and chemical examinations made by the military sanitary officers no coliform organism nor anything suggesting contamination was discovered.

3. The aerated water supply is good. The regimental factories of the Suffolk and Wiltshire Regiments and of the Royal Artillery are all in excellent order, the water used for bottle-washing is "pinked," and mechanical brushes are used ; the piped water supply is laid on to these buildings.

4. The three regimental dairies are fairly satisfactory. In all three the milk is sterilized before issue ; but the practice of obtaining cream for butter-making from Sukkur, or elsewhere, is condemned.

5. Up to a late period of the epidemic, the filth receptacles in barracks were still being emptied into the "Crowley" carts at the latrines, and there were numerous complaints from the non-commissioned officers and men about the stench from these carts in transit. The "Crowley" cart system of removal has now been abolished, and the receptacles are taken away bodily on lorries drawn by horses.

6. The makeshift arrangement for the disposal of nightsoil, by burying it in deep pits on the Kach Road, commenced as a temporary expedient in November, 1898, and recommended by the special committee as a safe measure for six months, has had to be continued up to date, but it will very shortly be possible to remove the nightsoil to the new permanent site selected at Shahzada, where its disposal can have no injurious effect on the health of the station.

7. The native latrines in use are iron ones of movable pattern, but in most instances there is not sufficient ground available to permit of the position of the latrines being changed often enough to be of any use. In the case of the latrines belonging to the three native regiments, the Cantonment Committee decided at a meeting held in December, that it was impracticable to either move the latrines at regular intervals or to cultivate the ground. The fouling of the sites used for these movable latrines thus becomes continuous, and the purifying action of sun and air is prevented. As Major Davies points out, a very insanitary condition of matters is brought about in this way, the upper layers of soil become increasingly fouled with excreta, fæcal washings, &c. ; and in the warm weather these upper layers of soil become converted into dust, which gets blown about the station.

8. In conjunction with the civil medical authorities, the sanitary condition of Quetta city was also investigated, and the following insanitary conditions were noted :— (1) Bad state of the surface drainage, brought about through insufficient flushing, due to the short supply of water, this being especially the case during the hot weather ; in many cases the drains were faulty in construction. (2) Fouling of the surface of the ground by both public and private latrines. With regard to the latter, there is no proper system of

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removal of nightsoil, the removal being entirely left to private arrangement (3) The refreshment rooms usually frequented by the soldier were dirty and badly ventilated, as is almost always the case with this class of place in bazars.

After careful consideration of all the circumstances connected with the outbreak, the chief conclusions formed were :—

1. That there was no evidence forthcoming that the disease germs were water-borne, or that infection was introduced by outside milk or cream supplies. Indeed, had this been the case, there would doubtless have been an outbreak of a more localized description, and one probably more explosive in character.

2. That some of the cases may have contracted the disease in eating or drinking places in Quetta city, or from drinking unauthorized water when out at manœuvres, is not unlikely ; no exact evidence, however, is obtainable with regard to these points.

3. Major Davies, in his report on the sanitary investigations at Quetta, remarks that no specific sanitary defect has been found in cantonments to account for the enteric prevalence, except the fouling of the ground that must inevitably take place by the use of the present type of native latrine, and with a native population of from 7,000 to 8,000 living in cantonments, the amount of fæcal fouling must have been very considerable. He further points out that this is the only insanitary condition of importance that has continued in cantonments since 1898, and that the other surroundings of the British soldier at Quetta are practically unexceptionable. In his concluding remarks Major Davies states that the causation of the recent epidemic is not at all clear, but gives it as his opinion that it appears on the whole to be most probable that fæcal infection of the soil by the use of a bad pattern of native latrine, followed by conversion of this infected soil into dust, and its dispersion throughout the lines by wind and dust storms, will afford the true explanation.

The theory of the air convection of the enteric poison at Quetta receives support from the following considerations :—

1. Exclusion of other possible sources of the disease after a prolonged and exhaustive investigation.

2. That although the dangerous condition brought about by the position of the filth trenches in the 1898 outbreak no longer exists, yet, as Major Davies points out, fæcal infection of soil by native latrines has continued, and there were thus numerous smaller breeding grounds.

3. In the 1898 epidemic the view that the enteric germ was conveyed by wind and dust from the then existing filth trenches, the disease attacking with special severity the neighbouring Left Infantry lines and Artillery barracks, is supported by the fact that in 1899 the artillery were quite free from the disease, while this year they have had few cases in proportion ; and further, that during the present outbreak the Right lines suffered more than the Left, whereas for years before, the opposite used to be the case. The importance of this improvement as regards enteric incidence in the Left lines will be better appreciated from a consideration of the statistics given in a table on page 193 of the Army Medical Department Report for 1898, in which the relative mortality in the Right and Left lines during a period of nine years is contrasted. In this table it is shown that from 1890 to 1898 the total number of deaths from enteric fever in the Left lines was 114 as compared with 32 in the Right lines, the respective ratios per 1,000 being 10·2 against 3·8.

At Secunderabad there were 77 admissions with 25 deaths, as compared with 48 admissions and 9 deaths in the preceding year.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Admissions ...	—	4	4	—	3	2	11	20	19	9	3	2
Deaths	—	1	2	—	1	—	—	11	5	2	1	2

There was a considerable increase of enteric prevalence as compared with 1899, the admission and mortality ratios for the year under report being respectively 30·3 and 9·83 against 16·8 and 3·14 per 1,000 in the preceding year. Enteric fever is always more or less prevalent at Secunderabad during and after the monsoon rains, but this year with the monsoon, together with a serious increase in enteric prevalence, a sharp outbreak of cholera also occurred. The origin of the enteric fever was not traced in any of the cases, but the medical officer in charge observed that flies were very numerous during the prevalence of both enteric fever and cholera, and was of opinion that they were very important agents in spreading the disease. As is usual here, the outbreak of enteric fever was widespread and not confined to any particular corps, barrack-room or block of barracks. Secunderabad is one of the stations having that very undesirable arrangement, separate water supplies for drinking and ablution purposes. Up to May, 1898, water for all purposes was obtained from the Jedimutta Tank (a piped supply), but the collecting area became so contaminated, and is so liable to contamination, that its use for drinking purposes was discontinued. It is still reported as unfit for drinking or cooking, owing to the large amount of organic matter present, but it has to be used for purposes of ablution, as the other supply, although abundant for drinking and cooking purposes, is insufficient for all the wants of the station. The drinking water is obtained from three large wells, which are well protected from contamination, and the water is reported as of excellent quality. It is conveyed to the different barracks in the station by water carts, the barrels being filled from standards erected near the wells. The water barrels are frequently rinsed out, and once a week they are thoroughly washed out with a solution of permanganate of potash. All the drinking water is boiled and "pinked."

Most of the men attacked were moderate drinkers, some were total abstainers, and a few were intemperate. Hardly any of the cases had been in the habit of drinking milk, but the majority of the men frequented the bazars, and some of them may have contracted the disease there. Five men, admitted for enteric fever, were attacked by cholera in hospital, with a fatal result in two instances.

At Lucknow 63 cases were admitted and 15 deaths resulted as compared with 82 admissions and 22 deaths in 1899.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Admissions ...	12	2	5	16	7	4	1	2	4	2	4	4
Deaths	5	—	1	2	2	2	2	—	—	—	—	1

The admission and mortality ratios were 31·4 and 7·48 per 1,000 respectively, against 33·2 and 8·90, the corresponding ratios for the previous year. The decrease of 1·8 in the admission rate shows a reduction of enteric prevalence, which is less than might have been expected, when it is considered that no drafts of fresh men from England joined the garrison during the year, and that nearly one-fifth of the men had undergone

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inoculation (single operation only). Lucknow is a station which is never free from enteric fever, and, as shown in the following table, there are two periods of the year during which the disease is specially prevalent, namely, November to January and March to May.

Monthly admissions for enteric fever for the ten years 1891–1900.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total Admissions.	Total Deaths.
Admissions ...	125	53	111	124	108	41	30	40	41	43	89	162	968	245

The cases admitted in 1900 were in nearly every instance severe in character. Of the men admitted, 14 had been inoculated against enteric fever, while 49 cases occurred among the non-inoculated men. Three deaths occurred among the inoculated and eight among the non-inoculated, giving a percentage of deaths of 21·4 among the protected men as against 16·3 among the others. It should, however, be mentioned in connection with this point that all the inoculations were done in the beginning of the previous year, and that in each instance only one inoculation was given, as the men were prejudiced against having the operation repeated. In the three fatal cases among the inoculated, the men were attacked thirteen, fourteen and fifteen months respectively after inoculation. The value of the figures given is therefore doubtful. There were no men inoculated during 1900.

The water supply for the whole station is the municipal supply from the river Goomti. The situation of the intake pipe is not satisfactory, as about 100 yards above its present position a nullah, into which the drainage of several villages flows, leads into the river. The nullah is closed by a bank of earth, which, however, is generally washed away during the rains. This matter has been brought to the notice of the authorities concerned. In other respects extensive precautions are taken to prevent pollution of the river banks and to otherwise ensure the purity of the supply. The water, after passing through filter beds, is laid on by pipes from the main to standpipes distributed in various places throughout the lines and cantonment. The water is examined weekly, and there is no evidence to connect it with enteric prevalence. The aerated waters are safeguarded to an extent unknown in former years. Milk and butter are supplied by the Government dairy farm, and the supplies are stated to be as good and pure as such supplies can be in other countries and climates. The places soldiers most frequent are kept in a good sanitary condition. The medical officer in charge of the station hospital sums up the case by stating that all the formerly dreaded sources are now as it were beyond suspicion and we must look somewhere else for the causation of this scourge. He draws attention to dust and flies as means of propagating enteric fever.

At Rawal Pindi there were 59 admissions with 12 deaths, as compared with 99 admissions and 19 deaths, the highest number of admissions at any station during the preceding year.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Admissions ...	7	1	—	7	5	12	8	7	2	7	1	2
Deaths	2	—	—	—	4	—	2	3	—	—	—	1

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There was a considerable diminution of enteric prevalence as compared with 1899, the admission ratio for 1900 being 21·6 per 1,000 of strength against 38·4 in the preceding year, while the death rate was 4·40 against 7·37. As is usual at this station, enteric fever began to prevail in April and continued throughout the hot weather months, and in the majority of the cases it was severe in type. The disease was spread over the cantonment and showed its usual wide distribution among corps and barracks. The water supply is described as wholesome, very pure and sufficient for all purposes. It is a piped supply, with taps in the kitchens, washhouses, and verandahs of barracks and hospitals. Milk and food supplies were satisfactory. The Allahabad system of disposal of nightsoil is in use, and the trenching ground is regularly inspected by a sanitary officer. In no instance could the disease be traced to its origin; but in one of the fatal cases the man had been employed as a nursing orderly in the special ward.

At Nasirabad there were 56 admissions with 21 deaths, as compared with 42 admissions and 10 deaths in 1899.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Admissions ...	6	3	5	14	2	—	1	2	14	7	1	1
Deaths	2	1	1	5	1	—	—	—	5	4	1	1

The admission and death ratios for 1900 were 71·7 and 26·89 against 50·1 and 11·93 in 1899. The admission rate of 71·7 per 1,000 is by far the highest in India for the year, and places Nasirabad at the head of the list of stations as regards enteric prevalence in relation to the strength of the garrison. The number of cases of enteric fever has steadily increased every year since 1892, and, notwithstanding that the proportion of men under one year's service in India was much below that of the preceding year (92 against 159), the disease was much more prevalent than in 1899. The disease was generally distributed. The admissions from the Artillery were in the same proportion as from the Infantry. Cases occurred in nearly every barrack-room, but 8 cases came from No. 12 room and 10 from No. 18 room in the Infantry barracks; no explanation or insanitary condition could be discovered to account for the large number of cases from these rooms. Two cases occurred in hospital; one was that of an orderly who was nursing enteric cases, and the other that of a patient under treatment for pneumonia. Of the 31 cases admitted in the first half of the year 19 were teetotallers, as were 6 of the 9 men who died; in the second half of the year, out of 25 cases, only one man was a total abstainer. There were two cases among the officers (both under one year's service in India), but no case occurred among the women, and only one among the children. The general sanitation of barracks, and the milk, aerated water and food supplies were satisfactory. With regard to milk, more than half of the men attacked stated that they never drank milk, not even in tea, and this appears to be a general custom with the men stationed here. The unsatisfactory surroundings of the soldier at this station are the double water supply, defective disposal of nightsoil and the very insanitary condition of the native quarter of Nasirabad.

Water for drinking and cooking purposes is obtained from the Dilwara well, two miles distant. This well is rented, and the right is reserved for natives to draw water from it, which is undesirable. The water is reported good, and is boiled in Larrymore boilers before being used for drinking. It is cooled and stored in Macnamara filter cases, permanganated and kept for use in covered *gurrahs* in the barrack-rooms. The water for ablution

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The admissions and deaths by corps were :—

Corps.	Admissions.	Deaths.
20th Hussars..	17	3*
2nd Royal Irish Regiment	9	2
22nd Battery Royal Field Artillery	6	—
"C" Battery Royal Horse Artillery	2	—
Ordnance Department	1	1

* One of these deaths was that of a man admitted in December, 1899.

As in 1897 and again in 1898 the 20th Hussars suffered most. This regiment contributed 14 out of the 21 cases which occurred at the time when the disease was most prevalent, July to October, as follows :—1 of the 3 cases in July, all the 6 cases in August, 6 out of the 11 cases in September, and the single case in October. The regiment was free from enteric fever from the 6th of February till the 12th of July. A sample of water from the cavalry barracks, which was examined by Mr. Hankin, was reported to contain a bacillus resembling that of enteric fever. In the report for 1898, the nearness of the native bazar to the barracks, and especially to the cavalry barracks, was considered to be a source of danger, as it was then stated that there had been a distinct prevalence of fever of enteric type amongst the bazar population. The water supply for the whole station is derived from the Baircha Lake, but the cases of enteric fever which occurred among the rest of the garrison show a general distribution as regards corps affected, barracks and period of year. Concerning this water supply, Major Davies, R.A.M.C., reported in 1898 that he considered that the source of the water was excellent, but that the supply was exposed to possible contamination at two points, (*a*) at the Baircha reservoir from the practically unrestricted access of natives ; and (*b*) at the service reservoir, which is open to receive the dust from the immediately adjoining roads and parade ground, as well as from the barrack bungalows situated near. The covering in of the service reservoir is under consideration. Up to the beginning of June of the year under report, the water in the Baircha reservoir was at an exceptionally low level, owing to the small rainfall of the previous year, and during this period, when the water was most concentrated and stagnant, the admission rate for bowel complaints, including enteric fever, was low, whereas, while the intake of the rains was going on, the admission rate for bowel complaints became greater. Larrymore boilers are in use for boiling the drinking water, which after cooling is also treated with permanganate of potash. The aerated water, milk, and food supplies are considered satisfactory.

At Peshawar there were 29 admissions with 15 deaths, against 41 admissions and 16 deaths in the preceding year.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Admissions ...	2	1	1	2	4	5	4	—	5	—	4	1
Deaths	2	1	—	2	1	3	2	—	1	1	1	1

A considerable decrease in the prevalence of enteric fever at this station was noted in last year's report. The returns for 1900 show a further diminution of enteric prevalence. Thus the admission ratio has fallen from 52·0 per 1,000 in 1898 to 19·5 in 1900. The type of the disease was, however, as is usual here, very severe. The disease was present throughout the year,

At Poona 43 cases occurred and 16 died, as compared with 17 admissions and 4 deaths in the previous year.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Admissions ...	1	1	2	—	1	1	3	7	20	6	1	—
Deaths	—	—	—	1	—	—	2	2	7	2	2	—

The admission ratio was 19·7, and the death rate 7·35 per 1,000. There were 6 admissions from the Ghorpuri barracks, the cases being of a sporadic character. The remaining 37 cases were admitted from the Wanowrie barracks, and the majority of these cases formed part of a sharp outbreak of the disease which occurred during the monsoon period, and which was at its height in September. The type of the disease during the outbreak was very severe. It was confined to the Wanowrie barracks, but its distribution there was general, the married quarters being included, as there were three married sergeants among the admissions, and there was in addition one case among the women and one among the children. None of the inoculated men contracted enteric fever. The disease is always more prevalent in the Wanowrie than in the Ghorpuri barracks. The water supply for both barracks is the same, and is derived from the Kharakwasla Lake situated about 12 miles from Poona. As the water is conveyed by an open canal, which skirts some native villages, there is grave danger of its being polluted in transit, more especially when the habits of the natives are remembered. The water is passed through settling and filtering beds of sand and charcoal, prior to distribution through the mains. Although the water supply has often been assailed, chemical and bacteriological examination yields negative evidence. Larrymore boilers are in use, and all drinking water is boiled and treated with permanganate of potash. As probably standing in a causative relation to this outbreak, attention is called to certain insanitary conditions in the Wanowrie barracks, the chief of which are faulty distribution and storage of water, faulty construction of water pipes, an insufficient conservancy establishment, and faulty location of latrines. The prevailing winds at Poona are from the south-west, and the city filth pits and ground where rubbish is burned are situated to the south-west of barracks. The wind blowing over these places may at times be a carrier of infected dust.

At Mhow there were 35 admissions with 6 deaths, against 49 admissions and 14 deaths in 1899.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Admissions ...	5	1	3	—	1	2	3	6	11	1	—	2
Deaths	1	—	1	—	—	—	1	1	1	1	—	—

In a year showing a considerable increase of sickness (chiefly ague and venereal diseases) among the troops at this station, it is satisfactory to observe a decrease in enteric prevalence. The admission and mortality ratios for enteric fever were 20·3 and 3·47 per 1,000, as compared with 29·3 and 8·37, the corresponding ratios in 1899.

India. and the mortality ratio, 4·08, a decrease of 4·89, when compared with the corresponding ratios for the preceding year. The greatest care was exercised in endeavouring to trace the origin of each case, but in no instance could the exact source be determined. The Sadr bazar is considered to be largely responsible for enteric fever in this station, and it is pointed out that during the period from May to November, when the station was practically free from enteric fever, the bazar was out of bounds for the men. The character of the Umballa water supply is suspicious, as it is conveyed along a leaky aqueduct, with innumerable points at which the water may become contaminated. The possibility of contamination being well known, greater care is probably taken in boiling the drinking water, treating it with permanganate of potash and safeguarding its subsequent storage.

At Multan there were 21 admissions with 7 deaths, against 16 admissions and 10 deaths in the previous year.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Admissions ...	—	1	2	6	5	4	—	2	1	—	—	—
Deaths	—	—	1	—	1	1	1	2	1	—	—	—

The admission rate was 23·1 and the death rate 7·71 per 1,000, as compared with 17·0 and 10·60 in 1899. The disease was of a milder and less fatal type than in the preceding year. In no instance could its source be traced to any sanitary defect in connection with the barracks. The majority of the cases occurred during the first half of the hot weather, when the heat at this station is very trying. At this season dust storms are frequent and flies are troublesome, and it is suggested that they may serve as disseminators of the disease by transferring enteric germs from the latrines and elsewhere. The water for drinking is obtained from wells which are used for no other purpose, and they are well covered in and protected. The supply is abundant, and though pure, as shown by analysis, it is boiled and "pinked" before being used.

At all other stations having cases of enteric fever the admissions were under 20.

Other Continued Fevers.— Under this heading there were 1,479 admissions with 2 deaths, all being returned as cases of simple continued fever. The average number of men constantly sick from this cause was 67·12, giving a constantly sick ratio of 1·11 per 1,000, which is ·37 less than the preceding year's rate and ·58 below the decennial average. The admission ratio was 24·4 per 1,000, which is lower than in 1899 by 7·6, and than the average rate by 14·7. The mortality ratio, ·03 per 1,000, is higher than last year's and the decennial average death rates by ·02 and ·01 respectively. The highest admission ratios were 198·9 in the Nagpur district, 76·1 in the Oudh district and 46·8 in the Allahabad district, showing increases of 143·3, 29·0 and 12·2, when compared with the corresponding ratios in the preceding year. The lowest admission ratios were ·8 in the Quetta district, 1·0 in the Rawal Pindi district, 1·3 in the Bombay district and 1·5 in the Mandalay district, as compared with ratios of 2·5, 4·4, 3·8 and 18·5 in the previous year. Among the other districts, an increase of 26·8 is observed in the admission rate for the Secunderabad district, while the Aden and Peshawar districts show decreases of 109·1 and 94·1 respectively. Of the two deaths, one occurred at Kamptee and the other at Agra. The cases returned as simple continued fever are nearly all instances of febrile attacks, usually mild and of short duration, occurring for the most part during the hot weather and resulting from exposure to the sun, over-exertion, errors of diet, chill, or other undefined causes. In about half a dozen out of the 39 admissions which

occurred at Ranikhet, in a few of the 102 admissions at Secunderabad and in one of the 24 admissions at Bangalore, the possibility of the cases being instances of ambulant or abortive enteric fever is mentioned, but the symptoms were not sufficient to warrant a diagnosis of the graver disease. The large increase in the admission ratio for the Nagpur district was brought about by 220 admissions for simple continued fever at Kamptee, or nearly four times the number of cases admitted there in the previous year. The increase is attributed partly to longer continued and greater rainfall than in 1899, and partly to the men generally having become debilitated, probably as the result of a too prolonged stay in this station.

Cholera.—There were 107 admissions with 88 deaths, as compared with 1 case (fatal) in 1899, the equivalent ratios being 1·8 and 1·45, which are higher than those in the preceding year by 1·8 and 1·44 respectively, and are also higher by ·4 and ·45 than the corresponding average rates for the preceding ten years.

Abstract XXII shows the stations at which cholera occurred during each quarter of the year. There were 2 fatal cases in the first quarter, 14 cases with 12 deaths in the second quarter, 88 cases with 71 deaths in the third quarter, and 3 fatal cases in the fourth quarter of the year. The disease was widespread. The cases occurred in 15 out of the 26 districts and at 27 different stations.

The station which had the greatest number of cases was Secunderabad, where there were 24 cases with 20 deaths in the third quarter of the year. Cholera made its appearance in Secunderabad after the monsoon rains had set in. It was prevalent in the bazars and in all the surrounding villages before it attacked the troops. All infected localities were at once put out of bounds, the native cooks were dismissed, and the drinking water was carefully boiled. Notwithstanding the precautions taken, the disease made its appearance among the men of the 4th Hussars late in July, the 1st Battalion Lincolnshire Regiment was next attacked, and lastly, the 1st Battalion Cheshire Regiment. The cholera ceased to affect the 4th Hussars as soon as the barrack-room in which it had occurred was vacated. As the disease was showing tendency to spread in the case of the two infantry regiments, they were moved into camps, after which no further cases occurred. The Artillery barracks remained free from disease, but two men belonging to the 23rd Battery, Royal Field Artillery, who were in hospital with enteric fever at the time, contracted cholera and died. There was only one case (fatal) among the women, and the children escaped altogether. Coincident with the outbreak of cholera, enteric fever was present in epidemic form among the troops.

There were 13 admissions with 10 deaths at Mian Mir and 7 admissions with 6 deaths at Fort Lahore. Two of the Mian Mir cases were admitted at Shalimar Camp; and in one of the fatal cases the man died out of hospital. Cholera was prevalent in the vicinity of cantonments at Mian Mir before it appeared among the troops. The source of the disease could not be traced; Lahore, the bazars and the neighbouring villages had been placed out of bounds, and the usual preventive measures were being carried out. The outbreak at Fort Lahore followed close on pay day and the subsequent visits of the men to the city. All the cases occurred between the 10th and 13th of September, and in every case except that of a patient in hospital the men had been out of barracks. It was discovered that the hospital patient had been visited by a man who was himself subsequently attacked, and the inference is that the latter conveyed to the former some contaminated food or drink. The men were at once moved from their barrack-rooms into tents pitched on the parade ground and afterwards into camp at Shalimar. No case occurred after moving out.

At Poona there were 9 cases, all of which died. Three of the cases occurred in hospital, where the men attacked were under treatment for dysentery. In no case could the source of infection be traced, but immediately the disease was detected isolation was carried out, and no other cases occurred. At the time of the cholera outbreak (the monsoon period) enteric fever was also very prevalent.

In the Mhow district there were 19 cases with 15 deaths, 9 cases with 8 deaths at Mhow, 8 cases with 5 deaths at Nasirabad and 2 fatal cases at

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Neemuch. At Mhow the outbreak began on the 1st of August and ended so far as admissions were concerned twelve days later. The first cases occurred in buildings far apart from each other, and it was ascertained that there had been no communication between the infected persons. Later the disease appeared in the Sisters' Ward of the section hospital, where seven cases occurred among the eleven patients in the ward; all the men attacked were patients suffering from bowel complaints, while the four men who escaped attack were suffering from other diseases. The origin of the disease was not discovered, but cholera was prevalent in the neighbourhood, especially in famine camps and famine-stricken villages. The source of infection was not traced in connection with the cases which occurred at Nasirabad and Neemuch, but in both instances cholera was very prevalent at the time among the native population.

At Delhi there were six fatal cases. Three of the cases occurred in June and three in September, and each time the disease attacked the Royal Artillery. Except in one case, death followed attack very rapidly. The source of infection could not be satisfactorily traced.

At Ahmednagar there were 4 admissions, of which 3 proved fatal. There were considerable intervals of time between the cases; 1 occurred in May, 2 in August, and 1 in September. Cholera was prevalent in some of the adjacent villages and in the native city, and several cases occurred in the cantonment bazar. The direct source of infection could not be traced in any of the cases.

At Meerut there were 3 fatal cases. The men attacked belonged to the Artillery, but each belonged to a different battery, and there was an interval of about ten days between each case. Two of the men were total abstainers. The first case was admitted on the 24th of August, and it was ascertained that he had been out fishing on the previous day and that he had partaken of fruit in a village where there were cases of cholera. No information could be obtained as to the probable source of the disease in the second case, but in the third case it was suspected that the man had been in the habit of frequenting the bazars, although at the time they were out of bounds.

At Benares there were 3 admissions with 2 deaths. The disease was extensively prevalent in the city and its vicinity. The three cases occurred at the end of May and the beginning of June. All three men belonged to the Army Temperance Association. The Army Temperance Association room was infested with rats and food was often left uncovered. This room was vacated, thoroughly cleaned, the rat holes filled up, and covered receptacles were provided for the food. No other cases occurred.

At Allahabad there were 2 fatal cases. One was a commissariat conductor living in quarters, and the other was a patient in hospital for inflammation of the inguinal glands. Both cases occurred in August, and at about the same time, but they were apparently unconnected, and in neither instance could the source of the disease be traced. Cholera was prevalent at the time among the civil population.

Two fatal cases occurred at Umballa, one in October, the other in November. One man was employed as a regimental policeman, and the other belonged to the garrison police, but in neither case could the source of the disease be discovered. Cholera had been prevalent in Umballa city and district during the hot season, but at that time no cases occurred among the troops.

At Mount Abu there were 2 admissions with 1 death, The men belonged to the band of the 1st Battalion Royal Fusiliers. The band itself came from Nasirabad where cholera was very prevalent among the civil population, but both of the men attacked came from Taragarh, where they had been stationed for six weeks. On the day previous to their departure from Taragarh a *chaprassi* died from cholera, the first case of the disease observed at that station. The first man sickened on the line of march and died 62 hours later. On arrival at Mount Abu the band was placed in a segregation camp, where the second case occurred, the man being attacked 60 hours after the first case and 50 hours after going into segregation camp.

There was a fatal case each at Calcutta, Dum Dum, Barrackpore, Dinapore, Jubbulpore, Peshawar, Madras, Purandhur, and Ahmedabad; and an admission each at Fyzabad, Agra, Bombay, and Deolali.

Dysentery.—There were 1,561 admissions with 58 deaths, the latter including 6 deaths among invalids who had left the Command, as compared with 1,720 admissions and 45 deaths in 1899. The admission and mortality ratios were 25·8 and ·96 per 1,000, which are higher respectively by ·4 and ·30 than the preceding year's rates. As compared with the ten years' average the admission rate shows a decrease of 2·1, but the death rate an increase of ·24. The average number of men constantly sick was 108·00, giving a ratio of 1·78 per 1,000, which is higher than in the previous year, by ·02, but lower than the average of the preceding ten years by ·16. Abstract XXIII shows the prevalence of the disease in each military district in India, and Abstract XXIV its prevalence in each quarter of the year. The highest admission ratio, 48·1 per 1,000, occurred, as in the preceding year, in the Presidency district, but shows a decrease of 25·5 when the two ratios are compared. The Deesa district came next with a ratio of 47·6, an increase of 38·9 on the previous year's rate; the third highest admission ratio was 45·2 in the Secunderabad district, an increase of 6·1, and the fourth highest 43·3 in the Mhow district, an increase of 22·1. The lowest admission ratio was 8·3 per 1,000 in the Quetta district, followed by 10·6 in the Rawal Pindi district and 12·7 in the Peshawar district, the three ratios being lower than in the preceding year by 6·7, 5·6 and ·3 respectively. The highest mortality ratio, 3·62 per 1,000, is observed, as in 1899, in the Presidency district, and is higher by ·29 than in the previous year. The southern district comes next with a ratio of 1·72 as compared with *nil* in the preceding year, and the Mhow district is third in order with a death rate of 1·68, an increase of 1·34. No mortality occurred from the disease in the Rohilkhand, Rawal Pindi, Peshawar, Madras, Mandalay, Deesa and Nagpur districts. Next to these, the lowest mortality rates were ·38 in the Bundelkhand, ·39 in the Quetta and ·49 in the Allahabad districts, showing decreases of ·46, ·03 and ·41 respectively.

Comparing the four quarters of the year as to seasonal prevalence of the disease, the largest admission ratio, 9·0 per 1,000, occurred in the third quarter, followed by 7·1 in the fourth, 5·0 in the second and 4·7 in the first. The same order of prevalence was shown in the preceding year. The highest mortality ratio, ·30 per 1,000, occurred in the third quarter, followed by ·26 in the fourth, ·18 in the first and ·13 in the second quarter. In the previous year the the mortality was highest in the third quarter, followed in order by the fourth, first and second quarters.

The station at which the largest number of cases occurred was Secunderabad, where there were 115 admissions with 4 deaths as compared with 112 admissions and 2 deaths in 1899. This station maintains its unenviable notoriety for dysentery, as it has shown the highest number of admissions for the disease four times in the last five years. The disease was of severe type during the year under report.

At Poona there were 76 admissions with 2 deaths as compared with 40 admissions in 1899. The greatest number of the cases occurred during the monsoon period.

At Umballa there were 64 admissions with 2 deaths. Some of the cases were of a very severe type, but the majority were mild in character. Abscess of the liver followed in one case.

At Mhow 62 cases were admitted. Two-thirds of the admissions occurred during the rainy months, at the time when diarrhœa and enteric fever were also very prevalent.

At Barrackpore there were 50 admissions with 4 deaths. Dysentery of severe type, and often complicated with liver abscess, prevails every year at this station. The months in which the disease was most prevalent were January (6 cases), June (8 cases), July (7 cases), September (6 cases) and December (7 cases). The specific cause of the disease is uncertain, but chill is regarded as the exciting cause. In only one case did liver abscess follow, as compared with three in the previous year.

At no other station than those noted did the number of admissions exceed 50.

Malarial Fevers.—There were 18,679 admissions for ague with 40 deaths and 766 admissions for remittent fever with 10 deaths, giving a total of 19,445 admissions and 50 deaths, with an average number constantly sick of

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710 67. In addition there were 12 deaths among invalids who had left the Command, 11 being due to ague, and 1 to remittent fever. The ratio of admission was 321·1 per 1,000, that of mortality 1·02 and of constantly sick 11·74, which are higher than those for the preceding year by 76·2, ·49 and 2·35. The admission and constantly sick rates are lower than the corresponding decennial average rates by 36·7 and ·66, but the death rate is higher by ·33. The highest admission ratio was 993·3 per 1,000 in the Mandalay district, which is 423·5 higher than the previous year's rate; the next highest being 764·0 in the Aden district, an increase of 293·7, followed by a ratio of 689·7 in the Lahore district, an increase of 324·2. The three highest ratios in the previous year were 569·8, 569·3 and 535·6 in the Mandalay Presidency and Belgaum districts respectively. The lowest admission ratio was 98·4 per 1,000 in the Rohilkhand district, and is higher than in 1899 by 23·7. The next lowest ratio was 118·1 in the Rawal Pindi district, a decrease of 105·4, and this was followed by 130·2 in the Quetta district, an increase of 56·2. 22 out of the 26 districts show increased admission ratios, the chief instances, in addition to those already mentioned, being increases of 269·6, 242·3 and 232·2 in the Mhow, Sind and Deesa districts. In addition to the Rawal Pindi district, already referred to, the only other instances of decreased admission ratios were decreases of 103·9, 157·2 and 181·8 in the Poona, Presidency and Belgaum districts. The highest mortality ratios were 4·46, 2·81 and 2·70 per 1,000 in the Mandalay, Rangoon and Lahore districts, the ratios showing increases of 2·91, 2·36 and 1·16 respectively. No mortality from malarial fevers occurred in the Oudh, Rohilkhand, Narbudda, Madras, Southern, Bangalore, Secunderabad, Nagpur and Quetta districts, and the lowest mortality ratios observed were ·17, ·27 and ·34 in the Rawal Pindi, Poona and Mhow districts respectively. Of the 50 deaths, 12 occurred in the Lahore district, 6 in the Mandalay district, 4 each in the Bundelkhand, Sirhind and Rangoon districts, 3 each in the Presidency, Peshawar and Belgaum districts, 2 each in the Meerut and Bombay districts, and 1 each in the Allahabad, Rawal Pindi, Poona, Mhow, Deesa, Aden and Sind districts.

The prevalence of malarial fevers in the four Commands was as follows:—

Commands.	Average Strength.	Admissions.	Ratios per 1,000.	Ratios per 1,000.	
				Increase.	Decrease.
Punjab	16,562	5,786	349·4	87·1	—
Madras	9,983	3,310	331·6	51·6	—
Bombay	15,051	4,929	327·5	101·6	—
Bengal	18,957	5,420	285·9	31·2	—

It was generally observed in all parts of India and Burma that the increase in prevalence of malarial fevers during 1900 was associated with heavier rains and a more prolonged wet season than usual, and that the greatest prevalence of these fevers was during the period when the rains were drying up. Wet and damp, by producing chills, no doubt acted as exciting causes in the case of men in whom the germs of malarial disease had already been sown, while it is equally certain that, during the drying up of the rains, many small pools would for a time be left, which would probably form ideal breeding places for the malaria-carrying anopheles. Mosquitoes of the anopheles species were observed at Ferozepore during the period when malarial fevers were epidemic. In the Agra report, it is remarked that during the flooding of the country by the rains the disease became generally prevalent, and anopheles were found in several puddles in barracks and in the hospital compound. In other reports it is stated that, although mosquitoes were abundant, the culex varieties alone could be found, and in other instances only one or two anopheles were discovered after

careful and repeated search. At Deesa and Neemuch the large increase of malarial prevalence followed heavy rainfall, when mosquitoes were plentiful, and among them specimens of anopheles were found. From Jhansi it is reported that the large increase may be accounted for by the late and heavy rains, but mosquitoes were not abundant in cantonments, and at Barrackpore the worst season for mosquitoes is stated to be in February and March, which is the healthiest period of the year at the station. At all the hill stations the increased admission rates are ascribed to the presence of a larger number than usual of malarially affected men from the plains. Increase in admissions at some of the stations in the plains was attributed to the arrival of regiments or smaller bodies of troops from stations with a malarial notoriety; thus, the admission ratio at Karachi was largely increased by the troops sent for a change from Ferozepore, at Calcutta the increase was attributed to a regiment coming from Dum Dum, and at Jullundur, Allahabad and Meerut, from regiments having been previously stationed at Mian Mir, Peshawar and Delhi respectively. The statements with regard to the value of the prophylactic issue of quinine are conflicting; it was stated to have had a beneficial effect at Dum Dum, Agra and Bellary, an uncertain effect at Deesa, an effect that was so doubtful that the issue was discontinued at Mount Abu, very disappointing in its effect at Ferozepore, no effect at Nasirabad, and at Mandalay quinine was issued freely as a prophylactic, but the admissions from malarial fevers increased. *India.*

Punjab Command.—As in the preceding year the highest admission ratio at any one station occurred at Ferozepore, but this year the ratio was 1,485·5 per 1,000, as compared with 506·0 in 1899. Ague was the cause of 1,331 admissions against 465 in the preceding year.

The following table shows the monthly admissions and deaths:—

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Admissions ...	22	7	11	11	4	19	30	78	129	399	385	236
Deaths	—	—	—	—	—	—	—	—	—	2	1	5

Malarial fevers became epidemic in September and prevailed with great severity to the end of the year. During July the admissions were only 30, in August they rose to 78, in September to 129, and then in October epidemic prevalence suddenly increased raising the number of admissions for the month to 399. There was nothing unusual during July and August about the type of the disease, but early in September, cases of the æstivo-autumnal malignant type became frequent. These cases were extremely severe and alarming, often being accompanied by the utmost collapse in which the patients appeared to be moribund, but nevertheless fatal results did not follow. A few cases with cerebral complications occurred in October, and many more in December, during which month five of them ended fatally. The cause of this widespread epidemic was doubtless connected with the abnormally heavy rains and floods that occurred in this district about the middle of August and latter end of September. The whole district for miles around was inundated, and many pools and ponds were formed. Mosquitoes are reported to have been unusually abundant and troublesome during the period of the epidemic, and the anopheles species was found in barracks, hospital and private bungalows. One important point observed in the course of the epidemic was that the incubation period of the disease is about 14 days. In proof the following evidence is given:—several instances of ladies with their children returning from the hills about the 15th of October began to suffer about the 30th:—a large number of women and children, who had been located in the hills during the summer, returned to Ferozepore in the middle of October, and, as far as can be remembered, not a single one of them escaped attack before the end of the

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month:—a similar state of things occurred amongst the band of the Oxfordshire Light Infantry, which returned from Dalhousie on the 13th of October, and 24 of them were in hospital before the end of the month. So extremely pernicious was the type of the disease, that the whole wing of the Oxfordshire Light Infantry had to be sent to Karachi for change of air, as the men were completely prostrated and incapacitated for their ordinary duties. The native troops in garrison suffered in like manner, while the disease is stated to have been extremely prevalent among the native population during the same period.

The next highest ratio was 1,059·0 per 1,000 at Mian Mir, a station which occupied the same position in 1899 with a ratio of 468·9. The number of admissions was 879 as compared with 400 in the previous year. Some of the cases were of severe type with protracted convalescence, and two fatal cases occurred in December. Fort Lahore comes next with a ratio of 786·4; the general health here was good up to the end of July, when the rains came, and these were immediately followed by a severe outbreak of malarial fever which was more or less prevalent till the end of the year. Amritsar and Multan follow with ratios of 565·4 and 486·8 respectively; but in the case of Multan the prevalence is chiefly attributed to a wing of the Bedfordshire Regiment, which had been temporarily employed at Mian Mir, returning saturated with malaria. All these stations belong to the Lahore district, in which district the malarial prevalence in the Punjab appears to have been concentrated.

In the Sirhind district, Subathu had an admission ratio of 446·6, and Umballa one of 417·4; in both instances the unusual malarial prevalence was associated with heavy and prolonged rains. At Kasauli a ratio of 574·8 was chiefly caused by admissions from men who had previously suffered from malarial fever at their stations in the plains. A similar reason is given in explanation of a ratio of 422·7 at Cherat. Elsewhere in the Punjab the prevalence of malarial fevers was moderate in character.

Madras Command.—Mandalay had the highest admission ratio, 1,435·9 per 1,000. There were 1,031 admissions with 5 deaths. The majority of the admissions occurred from July to December, during and after the rains. A notable feature in the prevalence of malarial fever at this station is that most of the cases belonged to the infantry regiment which is quartered within Fort Dufferin, whereas the artillery, whose barracks are situated near Mandalay Hill, were practically free from the disease. The infantry barracks are situated in a marshy locality on ground so low-lying that no system of drainage is likely to yield satisfactory results.

In connection with the severe outbreak at Fort Dufferin, it is noted by the medical officer in charge that malarial fever must always be more or less prevalent in Mandalay owing to locality and the nature of the surroundings. A low-lying marshy country, shallow pools, numerous channels, and canals of stagnant water characterize the district, and these conditions are exaggerated within the walls of Fort Dufferin, and the nature of the soil too—black cotton with a subsoil of clay—retaining water, is very favourable to the production of malarial fevers. As to the true cause of this outbreak nothing definite can be assigned. There can be no doubt that the anopheles helped to spread the disease, but that the mosquito was wholly responsible for the enormous increase in prevalence was not accepted by the local authorities.

As regards prophylaxis it is noted that quinine was issued to all men in barracks under strict supervision, without effect, certainly no good came from using it in this way; in point of fact it is recorded that after and during the exhibition of the drug as a prophylactic, the admissions were greater, and the type of fever more severe. The medical officer in charge gives it as his opinion, judging from former experience, that opium in small doses is a prophylactic.

The next highest admission ratio was 775·3 at Meiktila and represents 138 admissions, of which 126 cases, which occurred in the last three months of the year, were men belonging to two detachments of the 2nd Durham Light Infantry, who had been sent to Meiktila for a change on account of the severity of malarial disease in this regiment at Mandalay. The third highest ratio was 666·7 at Bhamo, a station which shows decreased prevalence as

compared with last year, when the ratio was 853·8; the greatest number of admissions occurred during the months of July, August, and October, and the prevalence of the disease appears to be associated with the formation of swamps during the rains on undrained land in the vicinity of cantonments. In the Madras Presidency itself, Poonamallee shows the highest admission ratio, 608·7, but in almost every case admitted at this station the disease would appear to have originated elsewhere. Bellary follows with a ratio of 602·4; the greatest malarial prevalence being in January and February, and in September, October, and November.

Bombay Command.—Deesa furnished the highest admission ratio, 983·8 per 1,000, as compared with 280·3 in 1899. The preceding year was a year of drought, and was followed by a famine. The rains in 1900 were much above the normal and were followed by an excessive amount of malarial fever among the debilitated civil population. During the time the disease was prevalent amongst the troops mosquitoes were plentiful, and among them specimens of anopheles were discovered. The next highest ratio was 829·8 at Taragarh, where, with an average strength of 47, there were 39 admissions, of which 27 occurred in October and November, all being men who had suffered severely from malarial fever at Nasirabad prior to being sent to Taragarh for change. The third highest admission ratio was 764·0 at Aden, an increase of 293·7 on the rate for the preceding year. All the corps in the station had a bad previous history for malaria, having been quartered at stations in India where malarial fevers are common. Thus the infantry regiment had been stationed in Dum Dum and Rangoon, and the three companies of Garrison Artillery had come from Ferozepore, Delhi and Barrackpore respectively. Another undoubted source of malaria was the Isthmus post, the barracks there being occupied by a company of infantry; malarial fevers became very prevalent, especially after a heavy rainfall in February, and many men belonging to the last draft, who had never previously suffered from fever, contracted the disease there. Nasirabad had a ratio of 705·5 per 1,000. At this station malarial fever assumed epidemic form in September, when the ground began to dry up after the cessation of the abnormally heavy rains, and the disease was still prevalent at the close of the year.

Bengal Command.—Delhi, with an average strength of 313, had 526 admissions, yielding a ratio of 1,680·5 per 1,000, which was the highest admission rate shown at any military station in India for the year. Delhi is notoriously malarious, but during the last ten years the nearest approach to the ratio for 1900 was one of 1,518·4 in 1898. Here, again, the increase of prevalence was associated with heavy rains and a prolonged wet season, and it is reported that mosquitoes of the anopheles variety were very numerous, and that all puddles were drained, and exposed surfaces of water covered twice weekly with kerosene oil, but without any apparent diminution in either the ague or the number of mosquitoes. Barrackpore, which had the highest admission ratio in the Command for malarial fevers in 1899, comes next with a ratio of 666·7, which is lower by 557·5 than the ratio for the preceding year. The prevalence of malarial fevers at this station has shown steady decrease during the last two years, and this is attributed to the new system of surface drainage and the drier condition of the subsoil. With regard to mosquitoes, the medical officer in charge states that the only place in which he was able to find specimens of anopheles was in his own bedroom. He could discover none in the hospital or in private houses, although numbers of mosquitoes were sent to him for examination, and he adds that the worst season for mosquitoes is in February and March, which is about the healthiest time of the year at Barrackpore. A comparison between the rainfall and the amount of ague is interesting. The rainfall was 100·51 inches with floods in September (46·7 inches), against 83·02 in 1899 and 52·52 in 1898, while the amount of ague has been in inverse proportion. In a low-lying place like Barrackpore, exactly the opposite might have been confidently predicted. At Dum Dum there was also a satisfactory diminution of malarial prevalence, the ratio for the year being 544·2, as compared with 732·4 in 1899.

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The incidence of malarial fevers at the various stations is shown in the following table :—

Stations.	Strength.	Admissions.	Ratio per 1,000.
Fort William	1,104	478	433·0
„ Fulta	8	1	125·0
„ Chingri Khal	34	9	264·7
Dum Dum	702	382	544·2
Barrackpore	306	204	666·7
Lebong	279	12	43·0
Darjeeling	333	54	162·2
Allahabad	818	184	224·9
Fort Allahabad	198	90	478·7
Dinapore	645	154	238·8
Benares	381	162	425·2
Lucknow	2,005	486	243·4
Lucknow Military Prison	35	22	628·6
Fyzabad	267	54	202·2
Sitapur	454	53	116·7
Fatehgarh	212	94	443·4
Cawnpore	744	173	232·5
Bareilly	1,122	198	176·5
Shahjahanpur	10	—	—
Ranikhet	949	13	13·7
Chaubuttia	281	28	99·6
Naini Tal	138	7	50·7
Jubbulpore	772	412	533·7
Saugor	307	133	433·2
Pachmarhi	105	10	95·2
Agra	1,212	241	198·8
Nowgong	398	120	301·5
Jhansi	994	244	245·5
Meerut	1,335	546	409·0
Muttra	77	23	298·7
Delhi	313	526	1,680·5
Roorki	366	110	300·5
Chakrata	1,126	34	30·2
Landour	209	83	397·1
Marching	728	78	107·1
Total—Bengal Command ..	18,957	5,420	285·9

Stations.	Strength.	Admissions.	Ratio per 1,000.
Umballa	1,471	614	417·4
Dagshai	561	36	64·2
Solon	141	5	35·5
Subathu	421	188	446·6
Jutogh	238	15	63·0
Kasauli	381	219	574·8
Mian Mir	830	879	1,059·0
Jullundur	658	126	191·5
Ferozepore	896	1,331	1,485·5
Fort Lahore	103	81	786·4
Amritsar..	191	108	565·4
Multan	908	442	486 8
Dalhousie	865	103	119·1
Rawal Pindi	2,729	306	112·1
Sialkot	660	167	253·0
Campbellpore	257	10	38·9
Fort Attock	164	26	158·5
Khyra Gali	71	1	14·1
Bara Gali	45	3	66·7
Kuldana..	455	12	26·4
Kalabagh	51	4	78·4
Camp Gharial	406	41	101·0
,, Thobba	439	79	180·0
,, Upper Topa	175	10	57·1
,, Lower ,, ...	59	10	160·5
Khanspur	254	19	74·8
Murree	96	4	41·7
Peshawar	1,491	514	344·7
Nowshera	755	233	308·6
Cherat	362	153	422·7
Marching	429	47	109·6
Total—Punjab Command ..	16,562	5,786	349·4

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Stations.	Strength.	Admissions.	Ratio per 1,000.
Madras	512	119	232·4
St. Thomas' Mount	291	56	192·4
Pallaveram	81	8	98·8
Poonamallee	161	98	608·7
Wellington	838	261	311·5
Cannanore	94	3	31·9
Calicut	88	—	—
Malapuram	145	9	62·1
Bangalore	687	123	179·0
Belgaum	1,002	236	235·5
Bellary	498	300	602·4
Ramandroog	18	1	55·6
Secunderabad	2,542	361	142·0
Rangoon	906	197	217·4
Port Blair	141	20	141·8
Thayetmyo	198	17	85·9
Meiktila	178	138	775·3
Mandalay	718	1,031	1,435·9
Shwebo	409	160	391·2
Bhamo	219	146	666·7
Marching	257	26	101·2
Total—Madras Command ..	9,983	3,310	331·6
Poona	2,178	256	117·5
Ahmednagar	594	73	122·9
Kirkee	677	192	283·6
Satara	175	27	154·3
Purandhur	109	28	256·9
Mhow	1,727	706	408·8
Nasirabad	781	551	705·5
Neemuch	297	199	670·0
Indore	128	46	359·4
Taragarh	47	39	829·8
Bombay	1,164	178	152·9
Deolali	406	248	610·8
Khandalla	30	4	133·3
Deesa	185	182	983·8
Ahmedabad	203	56	275·9
Mount Abu	95	36	378·9
Aden	1,106	845	764·0
Karachi	1,034	452	437·1
Hyderabad	441	184	417·2
Kamptee	1,042	282	270·6
Sitabaldi	69	14	202·9
Quetta	2,543	331	130·2
Marching	20	—	—
Total—Bombay Command ..	15,051	4,929	327·5
Total—India	60,553	19,445	321·1

Septic Diseases.—There were 44 admissions with 3 deaths, as compared with 112 admissions and 7 deaths in 1899. There were 35 cases of erysipelas, 5 of phagedæna (4 sloughing), 3 of pyæmia and 1 of septicæmia. Two of the deaths were due to pyæmia and 1 to septicæmia. The admission ratio was ·7 per 1,000, against 1·7 in the preceding year and a decennial average rate of 1·7. The mortality ratio was ·05, as compared with ·10 and ·11, the previous year's and the decennial average rates respectively. The average number of men constantly sick was 3·12, giving a ratio of ·05, as against ·11 in 1899, and ·11 the average rate for the preceding ten years. In only two districts did the number of admissions reach 5; these were the Sirhind district with 8 cases and the Peshawar district with 5. The deaths from pyæmia occurred at Lucknow and Jhansi, and the fatal case of septicæmia at Mhow. *India.*

Tubercular Diseases.—There were 225 admissions with 56 deaths (including 17 among invalids who had left the Command), with a constant inefficiency of 41·77 men. The admission, death and constantly sick ratios were 3·7, ·92 and ·69 per 1,000, as compared with 3·6, ·72 and ·69 respectively in the preceding year, and with 4·2, ·83 and ·75 the corresponding decennial average rates. 205 admissions and 49 deaths were due to tubercle of the lung. Nagpur is the only district which shows no admissions for these diseases. The Bombay and Madras districts for the third time in succession furnish the highest admission rates for the year. The admission ratio in the Bombay district, 28·1 per 1,000, is the highest for 1900, while it is also higher than in the previous year by 5·0. The continued high admission ratio in this district does not mean that tubercular diseases are more prevalent in the Bombay district than elsewhere in India. The ratio for 1900 represents a total of 45 admissions, of which 36 occurred at Deolali, as many as 18 admissions occurring there in one week. Nearly all these cases were admitted during the trooping season, and nearly all were instances of re-admissions of men invalided for tubercular diseases from other parts of India, passing through the invalid depôt at Deolali on their way to England. Without this explanation the high admission ratio is misleading. The Madras district had an admission ratio of 12·4 per 1,000, an increase of 5·1 on the previous year's rate. The Presidency and Sind districts come next in order with admission ratios of 6·5 and 6·1, which are higher by 2·8 and 5·4 than the ratios of the preceding year. In the other districts showing increased admission rates the increases were comparatively low, varying from ·3 in the Oudh district to 2·3 in the Bangalore district. The chief instances of decrease occurred in the Rohilkhand, Deesa and Belgaum districts, where the ratios were lower than in 1899 by 3·6, 3·1 and 2·9 respectively, the decrease in other districts varying from ·1 in the Rangoon district to 1·9 in the Lahore district. Of the 39 deaths in India, 7 occurred in the Bombay district, 6 in the Presidency district, 4 in the Meerut district, 3 in the Rawal Pindi district, 2 each in the Oudh, Narbudda, Sirhind, Lahore, Peshawar and Mhow districts, and 1 each in the Allahabad, Bundelkhand, Madras, Belgaum, Secunderabad, Rangoon and Sind districts.

Venereal Diseases.—For *primary syphilis* there were 2,597 admissions, giving a ratio of 42·9 per 1,000, which is lower than in 1899 by 14·5, and than the decennial average rate by 82·6. The average number of men constantly sick from this cause was 262·77, being in the ratio of 4·34 per 1,000, which is less than in the preceding year and than the ten years' average by 1·29 and 6·88 respectively. *Soft chancre* caused 4,042 admissions, with an average number of 347·29 men constantly sick. The admission ratio, 66·8 per 1,000, is higher than in the previous year by 3·7, but lower than the decennial average by 4·2, while the constantly sick ratio, 5·74, is higher by ·95 and ·25 in the two comparisons. The admissions for primary syphilis and those for soft chancre give a total of 6,639 admissions for primary venereal sores, with an average number of 610·06 men constantly sick. The combined admission and constantly sick ratios, 109·6 and 10·07, are respectively lower than in 1899 by 10·9 and ·34, and than the combined decennial average ratios by 86·9 and 6·64. *Secondary syphilis* was the cause of 3,786 admissions and 15 deaths, two of which occurred in invalids after leaving India, the average number constantly sick being 399·06 The admission ratio, 62·5, and the constantly sick ratio, 6·59 per 1,000

are lower by 9·4 and ·95 respectively than in the preceding year, and they are also 14·6 and 1·47 below the decennial average rates, but the mortality ratio, ·25 per 1,000, is higher than in 1899 by ·01, and than the decennial average rate by ·05. *Gonorrhœa* caused 7,624 admissions and one death, giving an admission ratio of 125·9, and the average number of men constantly sick was 621·21, the ratio being 10·26 per 1,000. Compared with the ratios for 1899, the admission ratio is higher by 4·8, and the constantly sick ratio by ·88; but in comparison with the average rates for the preceding ten years, the admission ratio is lower by 43·8, and the constantly sick ratio by 2·64. All these forms of venereal disease taken together give a total of 18,049 admissions, as compared with 21,217 in 1899, 24,286 in 1898, 32,768 in 1897, and 36,058 in 1896. The total admission ratio was 298·0 per 1,000, which is 15·5 lower than in 1899, and 145·3 below the decennial average. The total constantly sick ratio was 26·92 per 1,000, representing a constant inefficiency of 1,630·33 men, as compared with 1,851·31 in 1899, and 2,201·81 in 1898, the ratio being ·41 lower than in the preceding year, and 10·75 less than the average ratio for the preceding ten years.*

The large decrease of venereal disease which has occurred during the last three years will be best appreciated by reference to the following table, which shows the ratios of admissions per 1,000 since 1895 :—

Year.	Ratios per 1,000 Admissions.	Year.	Ratios per 1,000 Admissions.
1895	536·9	1898	371·4
1896	511·6	1899	313·5
1897	507·8	1900	298·0

It will be observed that the admission rate for venereal diseases has fallen from 536·9 per 1,000 of strength in 1895 to 298·0 in 1900, and it is satisfactory to note that the decrease of venereal prevalence, which first became marked in 1898, has continued steadily to the close of the year under report. The average stay of a case in hospital was 32·97 days, as compared with 31·89 days in the previous year, and the total loss of service was 595,070 days, against 675,728 days in 1899, 803,661 days in 1898, and 1,091,930 days in 1897. It is also noted that the whole of the decrease of venereal disease in 1900 was due to a lessened prevalence of syphilis, and particularly of primary syphilis. A considerable diminution in the admission ratio for primary syphilis was also observed in 1899, and no doubt the decreases in both years had a direct effect in lessening the number of admissions for secondary syphilis in 1900. While there was a decrease of syphilitic affections during the year under report, the admission rate for gonorrhœa showed an increase of 4·8 per 1,000 of strength, and that for soft chancre of 3·7.

The Bombay Command shows the highest admission ratio for gonorrhœa, while it also shows a considerably increased prevalence of venereal diseases generally, an increase of 53·3 per 1,000, as compared with the Command admission ratio for 1899. The increase of venereal disease at a number of

* There were 108 admissions for ulcer of penis of non-venereal origin, with 7·97 men constantly sick. If, as in former years (prior to 1897), these cases were included with those of primary syphilis and soft chancre under the heading of primary venereal sores, the admission and constantly sick rates for all venereal diseases would equal 299·8 and 27·05 respectively.

stations in the Bombay Command—an increase that affected native as well as European troops and also the civil population at these stations—was caused by the amount of disease spread by famine-stricken women, who flocked to the neighbourhood of cantonments, and earned for themselves a bare subsistence by prostitution. At stations where an increase of venereal disease was observed during the year, various causes are given in explanation of the increase of prevalence. In many instances cases of venereal disease were admitted, in which the disease had been contracted at other stations, as, for example, among troops returning from the hills to their stations in the plains, while on the other hand, many cases of disease were admitted at the hill stations which had been contracted by the men in bazars and villages, during the march up. The introduction of disease by a badly affected regiment or detachment coming to a station which was previously comparatively free from venereal prevalence, and the introduction of disease by fresh drafts from England, are also mentioned as helping to swell the number of admissions at some stations. At a few stations there is no cantonment hospital to which diseased women might be admitted for treatment; at others the Cantonment Act is not in force, or it is not sufficiently wide-reaching in its provisions, and does not give sufficient powers to the local authorities. Thus, for instance, women may go and live just outside cantonment limits, and may carry on prostitution with impunity, but they are beyond control, as they are outside the jurisdiction of the cantonment authorities. Again, by the working of the Act, women may be excluded from one military station only to go and spread disease in another. It is also brought to notice that sometimes when troops move from the plains to the hills, numbers of the women leave the stations in the plains and settle down in the neighbourhood of the hill stations. Much disease is contracted outside cantonments, in the native city, or in neighbouring villages. Another fertile source of dissemination, and one difficult to control, is the disease contracted in the open. Women loiter about near barracks, or near the rifle-range, or about the roads, or in the fields, or, as at hill stations, about the hill sides and nullahs. At Meiktila disease was often contracted from coolie women employed in connection with irrigation and water works. At Jubbulpore, when the troops were under canvas for a time some miles out of the station, diseased women from the native city used to haunt the vicinity of the camp at night. At Poona, when the bazars were put out of bounds on account of plague, road solicitation became rampant. At Bangalore, where a gratifying decrease of venereal disease was noted during 1899, increased prevalence occurred during 1900, although the same preventive measures (chiefly arrangements for personal ablution existing in each corps, and the after treatment of venereal diseases in barracks on leaving hospital) were in vogue, and were carried out quite as carefully as in the preceding year. At this station, since the beginning of 1900, a careful note of the source of the disease in every case of primary syphilis or gonorrhœa was made on the morning of admission, with the result that it was discovered that out of 93 cases of primary syphilis 86 men contracted the disease in the open air and 7 in houses, and of the 108 cases of gonorrhœa only 6 were traceable to houses, 103 being contracted in the open.

For the diminution of venereal prevalence there are many influences at work, each probably contributing in greater or lesser degree to the same end. The cantonment hospitals have done good work during the year, women often presenting themselves voluntarily for treatment. Sometimes the men were reluctant to point out the women who gave them the disease, a reluctance which is easy enough to understand if the man contracted the disease in a place which was out of bounds at the time; sometimes they were unable to point them out, but as a rule information more or less reliable is readily enough obtained. The provision of means of ablution for the men when they return at night is stated to have had beneficial results. Placing the bazars out of bounds on account of the prevalence of plague, cholera, small-pox and venereal itself, is reported to have been followed by a diminution of the venereal admissions in some instances, but in one or two others no benefit was observed. Strict surveillance of all roads, parade grounds and other open spaces in the vicinity of barracks after nightfall is carried out in some places. The moral effect of warnings

India. and short addresses and the good influence of the encouragement of athletics and evening entertainments in keeping the men away from temptation is alluded to in several reports. The curtailment of certain privileges to all men who contract venereal disease, and causing every man when discharged from hospital to make up the number of guards, &c., that he has missed while incapacitated for duty through venereal disease is mentioned as having a deterrent effect. The absence of young soldiers fresh to the country, consequent on the ordinary reliefs not having been carried out during the year, is considered a likely cause of decrease.

The practice of keeping the men under regular observation and of continuing treatment in cases of syphilis after the men have been discharged from hospital has practically become universal, and reports favourable to the system have been received from all parts of India. In the majority of instances there is little difficulty experienced in carrying out the method, as most of the men can readily be brought to appreciate the fact that the continued treatment of the disease affords the best chance of its thorough eradication. In the annual reports it is repeatedly remarked that the men under treatment improved greatly in health and appearance. As the men remain at duty loss of service is greatly lessened, and, from statements made in some of the reports, there is no doubt that part of the reduction in the invaliding for secondary syphilis which is observed for the year under review, and the considerable financial saving to the State resulting therefrom, may be placed to the credit of the out-patient plan of treatment.

It has been stated that the rapid descent of the admission rate in the last two years was "partly unreal" and due to the widespread adoption of the system of treating men affected with venereal as out-patients. If by this it is meant that the plan is likely to conceal to some extent the true prevalence of venereal disease in India, as out-patients will cease to be shown as admissions, it is well to point out that the result of the plan will really be to get a much nearer approximation to the real extent of the prevalence of venereal disease among the troops in India than was possible before. When one reads that there were so many admissions for a certain disease, the first impression in the mind is that the number of admissions means the number of individuals who have contracted that disease. The fact is apt to be forgotten that a considerable number of the admissions, for such diseases as malarial fevers, secondary syphilis and gonorrhœa, are instances of re-admission. This is particularly true of secondary syphilis, as owing to recurrences it is quite possible for the one individual to be shown as an admission two, three or even more times during the same year. The statement that there were 3,786 admissions for secondary syphilis in 1900 does not mean that 3,786 different men suffered from that disease; the true number will be under that figure. With the out-patient plan of treatment it is of course possible that in a very few instances cases of disease may be treated as out-patients from the beginning, and may in that way escape record. But now, as individual cases will, as a rule, only have one admission and will become out-patients when active signs of their disease have subsided, under the new plan each admission shown will nearly always mean a fresh case, and the total of such admissions will more nearly indicate the true prevalence of the disease.

The admission and constantly sick ratios for the four Commands were as follows:—

Commands.	Ratios per 1,000.		Comparison with 1899.			
			Increase.		Decrease.	
	Admissions.	Constantly sick.	Admission Ratio.	Constantly sick Ratio.	Admission Ratio.	Constantly sick Ratio.
Madras	354·4	32·06	—	—	43·4	1·98
Bombay	327·0	29·76	53·3	4·80	—	—
Bengal	299·8	28·55	—	—	65·1	5·11
Punjab	235·8	19·39	9·1	2·19	—	—

As in the preceding year, the prevalence of venereal disease was highest in the Madras Command and lowest in the Punjab, but the Bombay and Bengal Commands held reversed positions. As in 1899, the Madras Command had the highest admission ratio for primary syphilis and soft chancre, and, as usual, for secondary syphilis. The highest admission rate for gonorrhœa was in the Bombay Command. The Punjab showed the lowest admission ratios for primary venereal sores and for gonorrhœa, while Bengal had the lowest ratio for secondary syphilis. *India*

Comparing next the prevalence of syphilis and gonorrhœa in the various districts, as shown in Abstract XIX, the Bangalore district, as in 1899, had the highest ratio of admission for primary syphilis, 135·4 per 1,000, but the ratio shows a decrease of 9·6. The second highest ratio was 95·1 in the Mandalay district, a decrease of 14·1 on the previous year, and next in order comes a ratio of 60·6 in the Quetta district, an increase of 37·3, followed by 60·4 in the Rohilkhand district, a decrease of 52·3. The lowest admission ratio for primary syphilis was 7·2 per 1,000 in the Aden district, a decrease of 4·7; the next lowest ratio was 17·7 in the Allahabad district, a decrease of 38·9, and the next was 21·1 in both the Belgaum and Peshawar districts, a decrease of 18·4 for the former, but an increase of 4·3 for the latter district. The other instances of increased admission rates were increases of 27·8, 23·2, 9·9, and 6·3, in the Mhow, Poona, Presidency, and Sirhind districts respectively. All the other districts show decreased admission ratios, the chief instances of which, in addition to those already mentioned, were decreases of 68·1, 64·8, 56·2, and 52·3, in the Narbudda, Rangoon, Bombay, and Rohilkhand districts. Secondary syphilis was also most prevalent in the Bangalore district, the admission ratio being 132·5 per 1,000, an increase of 46·4 on the previous year's rate. The next highest ratio was 112·9 in the Madras district, an increase of 36·7. The Bombay district was third with 110·6, showing a decrease of 24·7 on the rate for the preceding year, when this district had the highest admission ratio. Other instances of high admission ratios were 109·6 in the Rangoon, 102·1 in the Southern, and 100·1 in the Belgaum districts. The lowest admission ratios were 24·4 in the Aden, and 38·4 in the Bundelkhand districts, showing decreases of 15·8 and 30·9 respectively, and the third lowest was a ratio of 41·7 in the Quetta district, an increase of 12·6. In addition to those already mentioned, the only other increases were 35·3, 18·5, 9·7, 3·0, 2·2, and ·4, in the Rangoon, Rawal Pindi, Peshawar, Sirhind, Poona, and Mhow districts. Decreases of 44·9, 43·5, 42·8, and 42·6, in the Mandalay, Narbudda, Allahabad, and Rohilkhand districts, were the chief instances showing considerable decrease of admission ratio. Gonorrhœa was most prevalent in the Deesa districts, the admission ratio being 269·2 per 1,000, an increase of 154·6 on the ratio for 1899. The next highest ratios were 209·7 in the Mhow and 184·0 in the Poona district, showing increases of 102·5 and 57·6 respectively. The lowest admission ratio was 26·2 per 1,000 in the Aden district, a decrease of 31·3, and the next lowest ratio was 79·5 in the Mandalay district, a decrease of 19·9, followed by a ratio of 82·7 in the Sind district, an increase of 3·8. The Allahabad district, which had the highest ratio of admission for gonorrhœa in 1898 and 1899, this year has a ratio of 117·6, as compared with 219·2 in the former and 218·9 in the latter year.

With regard to the prevalence of venereal disease at individual stations, the admission ratios showed increase in 44 and decrease in 60 stations. The highest admission ratio was 676·8 per 1,000 at Neemuch, an increase of 280·2, and this was followed by a ratio of 605·4 at Deesa, an increase of 275·9. Next comes Pallaveram (strength 81) 567·9, Mount Abu (strength 95) 557·9, Satara (strength 175) 554·3, Ahmedabad (strength 203) 551·7, Deolali (strength 406) 509·9, Indore (strength 128) 507·8, and Shahjahanpur (strength 10) 500·0. The greatest increases of ratio (increases of more than 100 per 1,000) were 404·1 at Mount Abu, 318·8 at Nasirabad (strength 781), 281·3 at Lower Topa (strength 59), 264·1 at Indore, 228·2 at Purandhur (strength 109), 202·3 at Satara, 192·9 at Pallaveram, 173·6 at Meiktila (strength 178), 165·8 at Subathu (strength 421), 138·0 at Gharial (strength 406), and 135·0 at Mhow (strength 1,727). It will be observed that a large proportion of the stations mentioned as showing largely increased admission rates belong to the Bombay Command. In the reports from Neemuch, Deesa, Nasirabad, Indore, Mhow, and Mount Abu, increased venereal prevalence was attributed, as already stated, to the

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increased facilities afforded for contracting the disease, by reason of the la numbers of famine-stricken women who were driven into cantonments want, and who resorted to prostitution for a living. The largest decrea of ratio (decreases of more than 300 per 1,000) were 513·9 at Ramandro (strength 18), 397·7 at Saugor (strength 307), and 326·2 at Solon (streng 141).

In 20 stations the ratio for primary venereal sores was over 150 per 1,0 of strength, the highest ratios being 340·4 at Taragarh, 333·3 at Pallavera 269·4 at Neemuch, 251·2 at Ahmedabad, 244·1 at Madras (strength 51 227·0 at Deesa, 213·3 at Jhansi (strength 994), 211·3 at Nasirabad, 210·9 Indore, and 209·7 at Rangoon (strength 906); while 28 other stations had admission ratio exceeding 100 per 1,000.

The admission rate for secondary syphilis was over 100 per 1,000 strength in 20 stations, against 26 in 1899, the highest ratios being 329·2 Poonamallee (strength 161), 302·8 at Purandhur, 293·1 at Deolali, 157·9 Mount Abu, and 145·8 at Murree (strength 96); while in 15 other statio the ratio was over 75 per 1,000.

The highest admission rates for gonorrhœa were 331·4 at Satara, 316·5 Neemuch, 313·5 at Deesa, 300·0 at Shahjahanpur, 273·7 at Mount Abu, 254 at Benares (strength 381), 226·6 at Ahmedabad, 225·4 at Nasirabad, and 211 at Agra (strength 1,212).

Hydrophobia.—There were 3 admissions and 4 deaths, one of whi occurred out of hospital at Cawnpore. The man had been bitten on the le hand near the thumb by his own dog some months previously, and it w stated that as the dog subsequently developed rabies it was killed. T disease attacked the man while out shooting with some comrades and prove rapidly fatal. The first of the three fatal admissions occurred at Rawal Pin in June. The second was that of a man who had been in hospital at Barrac pore in a low state of health for some time before symptoms of hydrophob made their appearance. He had been bitten by a dog at Lucknow more tha ten months previously, but had taken no notice of the circumstance. In t third case, which occurred at Saugor, the patient was bitten on the nose an hands by a rabid dog on the 11th of October. The dog sprang at his fac seized the nose and worried it, holding on until the man forced the animal jaws apart. There were 13 wounds on the nose, 3 of which were deep, an there was extravasation of blood under both eyes. The wounds were treate with nitric acid, and on the 13th of October the patient was sent to the Paste Institute at Kasauli. Shortly after his return from Kasauli, he was detaine in hospital for the day with slight fever, and on the following morning, t 24th of November, symptoms of hydrophobia declared themselves, and t disease running an extremely rapid course, death occurred from exhaustic at ten o'clock the same night.

During the year, an institute was opened at Kasauli for the preventi treatment of hydrophobia and other diseases. This institute, which is know as the Pasteur Institute, is under the charge of Major D. Semple, R.A.M.C under whose direction it was arranged and equipped. It was opened for t treatment of cases on the 9th of August 1900, and between that da and the 31st of December no fewer than 52 cases were treated among th troops:—

European Troops.		Native Troops.	
Officers	10	Officer	1
Non-commissioned officers and men.	33	Non-commissioned officers and men.	6
Soldiers' children	2		

and 17 Europeans and 41 natives among the civil population. These figur speak for themselves as to the good work done, even in the first few month Apart altogether from the inestimable advantage of being able to treat suc cases with the least possible delay, thus shortening to the smallest limi the period of suspense and anxiety to the patient, and, in direct proportion

the delay avoided, lessening the risk of untoward results, the financial saving to the State must have been considerable. Had previous practice been followed 45 of these cases would have had to travel to Paris and back at Government expense. *India*

Parasitic Diseases.—There were 541 admissions, including 242 for ringworm, 28 for tinea versicolor, 157 for tænia solium, 11 for tænia mediocanellata and 85 for scabies, giving a ratio of 8·9 per 1,000, as compared with 10·8 in the preceding year, and 10·4 the decennial average rate. The highest ratio, 33·5 per 1,000, again occurred in the Aden district, but the ratio shows a decrease of 13·1 as compared with the previous year. The next highest ratios were 23·7 in the Sind district and 21·5 in the Mandalay district. The lowest ratios, 2·1, 2·4, and 2·7, occurred in the Deesa, Quetta, and Bundelkhand districts respectively.

Scurvy.—There were 4 cases, as compared with 14 in the previous year, giving a ratio of ·1 against ·2 in 1899. There was one case each in the Presidency, Narbudda, Mhow and Sind districts.

Alcoholism.—There were 222 admissions and 2 deaths (one out of hospital). Twelve were cases of delirium tremens. The admission ratio, 3·7 per 1,000, was ·6 higher than in the previous year, but 1·0 lower than the average of the preceding ten years. The highest admission ratio was 9·0 per 1,000 in the Aden district, an increase of 3·5; the next highest being 5·6 in both the Rangoon and Rawal Pindi districts, the former showing an increase of 4·2 and the latter of 1·5. The lowest ratio was 1·2 in the Quetta district, a decrease of ·5; the next lowest ratios being 1·6 in the Secunderabad district, an increase of 1·3, and 1·6 in the Rohilkhand district, a decrease of 1·0.

Rheumatic Affections and Gout.—There were 1,332 admissions with 1 death, of which 54 admissions (1 fatal) were for rheumatic fever, 1,267 for rheumatism, 8 for gout and 3 for osteo-arthritis. The admission ratio, 22·0 per 1,000, is 4·6 lower than in the previous year and 7·8 less than the decennial average rate. The death rate was ·02 per 1,000, as compared with ·03 and ·04, last year's and the ten years' average rates respectively. The average number of men constantly sick was 94·54, being in the ratio of 1·56 per 1,000, as against 1·98 in the preceding year, and 2·15 the average rate for the previous ten years. The highest admission ratio was 42·5 per 1,000 in the Quetta district, showing a decrease of 29·0 on the rate for the previous year, when it also held the highest place. The next highest ratios were 36·4 in the Madras district, an increase of 8·3; 34·9 in the Belgaum district, an increase of 6·7, and 33·6 in the Sirhind district, an increase of 7·7. The lowest ratios were 8·8 in the Sind district, a decrease of 8·7; 9·0 in the Presidency district, an increase of ·5, and 10·8 in the Allahabad district, a decrease of 1·8.

Debility.—1,482 admissions are recorded and 2 deaths (both invalids). The admission ratio, 24·5 per 1,000, is 4·4 higher than in the previous year, and it is also 2·7 above the decennial average rate. There were 108·13 men constantly inefficient from this cause, being in the ratio of 1·79 per 1,000, as compared with 1·36 in 1899, and 1·48 the decennial average rate. The increased admission rate for debility was no doubt connected with the increase in malarial prevalence during the year. The highest admission ratios were 58·9 in the Lahore district, an increase of 1·1; 51·5 in the Aden district, an increase of 39·6, and 45·9 in the Madras district, a decrease of 23·0. The lowest ratios were 3·5 in the Quetta district, a decrease of 1·1; 6·2 in the Deesa district, a decrease of 6·0, and 8·5 in the Rawal Pindi district, an increase of ·7.

Other General Diseases caused 448 admissions and 8 deaths, one being that of an invalid, the equivalent ratios being 7·4 and ·17 per 1,000, as compared with 7·7 and ·24 in the previous year, and 8·3 and ·15 the decennial average rates. The admissions included 248 for non-malignant new growths (warts 193, fibroma 20, papilloma 11, lipoma 6, osteoma 5, myxoma 5, pterygium 2, chondroma 2, myoma 1, adenoma 1 and undefined 2), 108 for anæmia, 26 for beri-beri, 19 for cysts, 11 for diabetes mellitus, 9 for congenital phimosis, 8 for mumps, 4 for epidemic diarrhœa, 3 for purpura, 2 for sarcoma, and 1 each far carcinoma (scirrhus), epithelioma, tetanus, rickets, Hodgkin's disease, diabetes insipidus, harelip, hypospadiac fissure of the urethra, malformation

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of the face and congenital malformation of the testicle. The deaths were 3 from beri-beri, and 1 each from tetanus, carcinoma, sarcoma and anæmia, and the invalid died from diabetes mellitus. Of the 26 cases of beri-beri, 13 occurred at Mandalay, 10 with 3 deaths at Rangoon, 1 at Shwebo (disease contracted at Mandalay), and 2 at Poonamallee (disease contracted at Rangoon). The case of Hodgkin's disease occurred at Bangalore. The fatal case of tetanus was admitted at Barrackpore. While working in the forge at Fort Chingrikhal on the 6th of June the man became overpowered by the heat and fainted, and in falling the back of his right hand came in contact with a piece of red hot iron. Nine days later he was admitted to hospital at Barrackpore with symptoms of tetanus. He was treated with anti-tetanic serum. Death occurred on the 17th of June quite suddenly.

LOCAL DISEASES.—*Diseases of the Nervous System.*—There were 512 admissions and 25 deaths, one death being that of an invalid, giving ratios of 8·5 and ·42 per 1,000, as compared with 8·4 and ·31 in the previous year, and with 9·1 and ·34 the decennial average rates.

Mental diseases caused 100 of the admissions, with an average number of 27·83 men constantly inefficient from these diseases, the equivalent ratios being 1·7 and ·46 respectively. In 1899 the admission ratio was 1·4 and the constantly sick ratio ·41, while the corresponding decennial average rates are 1·5 and ·43. The highest admission ratio for mental disorders was 5·0 per 1,000 in the Bombay district, followed by 4·4 and 3·2 in the Bangalore and Rawal Pindi districts. Six of the 26 districts show no admissions, and among the other districts the lowest ratios were ·5 in the Poona district, and ·7 in the Rangoon and Mandalay districts. The causes of admission were melancholia 46, dementia 22, mania 19, delusional insanity 11 and general paralysis of the insane 2. One death occurred, that of the invalid referred to above, from general paralysis of the insane.

Excluding mental diseases there were 412 admissions for nervous affections and 24 deaths, with an average number constantly sick of 32·19, the equivalent ratios being 6·8, ·40 and ·53, as against 7·0, ·24 and ·51, the admission, death and constantly sick ratios for 1899, and 7·6, ·32 and ·53 the corresponding decennial ratios. The highest admission ratio was 18·1 per 1,000 in the Bombay district, a decrease of ·2 on the rate for the preceding year. Tha next highest ratios were 15·5 in the Southern district, an increase of 3·6, and 14·4 in the Madras district, an increase of 3·5. The lowest ratios were 3·1 in the Quetta district, an increase of ·2, 4·2 in the Narbudda district, a decrease of 3·4, and 4·3 in the Rawal Pindi district, a decrease of 1·8. The highest mortality ratio was 2·70 in the Nagpur district against *nil* in the previous year, the next highest being 1·46 in the Bangalore district, a decrease of ·40, and 1·36 in the Sind district as compared with no mortality in 1899. There were no deaths in the Rohilkhand, Narbudda, Southern, Belgaum, Rangoon, Mandalay, Poona, Bombay, Deesa, Aden and Quetta districts. The chief causes of admission were neuralgia 198, epilepsy 81, degeneration of spinal cord 15, local paralysis 13, headache 11, hemiplegia 11, inflammation of nerves 10, inflammation of the membranes of the brain 10, vertigo 8, hysteria 7, apoplexy 5 and abscess of the brain 3. The deaths were due to cerebral meningitis and apoplexy 4 each, pachymeningitis and abscess of the brain 3 each, leptomeningitis, congestion of the brain and myelitis 2 each, and spinal pachymeningitis, anterior poliomyelitis, softening of the brain and epilepsy 1 each.

Diseases of the Eye.—There were 650 admissions, giving a ratio of 10·7 per 1,000, which is ·4 higher than in 1899, but 1·0 below the decennial average rate. There were 41·79 men constantly sick from these diseases, being in the ratio of ·69 per 1,000, which is ·01 higher than that of the previous year, but ·05 lower than the decennial average rate. The highest admission ratio was 25·8 per 1,000 in the Mhow district, the third year in succession in which this district has shown a high rate of prevalence for diseases of the eye, and the ratio is 8·3 higher than in 1899. The next highest ratios were 16·6 and 16·2 in the Deesa and Lahore districts, showing increases of 9·7 and ·5 respectively. The lowest ratios were 4·3 in the Southern district, a decrease of 4·6; 5·1 in the Presidency district, a decrease of 2·3, and 5·4 in the Bundelkhand district, a decrease of 5·9. The chief causes of admission

were conjunctivitis 463, keratitis 39 (ulcerative keratitis 22), iritis 30, marginal blepharitis 26, stye 14, myopia 12, hypermetropia 12, and astigmatism 7.

Diseases of other Organs of Special Sense.—Under this heading there were 783 admissions, with an average number of 47·04 men constantly sick. The admission and constantly sick ratios were 12·9 and ·78 respectively, against 14·7 and ·81 in the previous year, and 15·4 and ·83 the corresponding decennial average rates. The highest rate of prevalence occurred in the Nagpur district, as in the two previous years, the admission ratio being 25·2 per 1,000, a decrease of 23·2 on the ratio for 1899. The next highest admission ratios were 22·0 in the Madras district, a decrease of 15·2, and 20·3 in the Narbudda district, a decrease of 10·7. The lowest admission ratios were 2·1 in the Deesa district, a decrease of 13·5; 3·9 in the Quetta district, a decrease of 4·8, and 6·9 in the Bombay district, a decrease of 4·9. 28 of the admissions were for diseases of the nose, including 12 for rhinitis and 9 for epistaxis. Diseases of the ear caused 752 admissions, chiefly, inflammation of the external meatus 529, perforation of the membrana tympani 102, inflammation of the middle ear 81 (suppurative 21), and deafness 22. Diseases of the accessory sinuses caused 3 admissions.

Diseases of the Circulatory System.—There were 738 admissions and 35 deaths (the latter including those of two invalids who had left the Command), giving ratios of 12·2 and ·58, as compared with 10·7 and ·64, the admission and mortality ratios for 1899, and with 10·1 and ·44 the corresponding decennial average rates. The average number of men constantly sick from these diseases was 74·29, the equivalent ratio being 1·23 as compared with 1·11 and 1·05, the ratios for 1899 and the decennial average respectively. For the fifth year in succession, the highest admission ratio occurred in the Bombay district, namely, 32·5 per 1,000, and this ratio shows an increase of 3·0 on the rate for the preceding year. The Lahore district comes next with a ratio of 25·2, an increase of 8·7, and the third highest ratio was 23·0 in the Mandalay district, an increase of 16·8. The lowest admission ratios were ·9, 4·3, and 5·1 in the Nagpur, Quetta and Narbudda districts, showing decreases of 1·8, 3·6 and 15·3 respectively. The highest mortality ratio was 5·20 per 1,000 in the Mandalay district, as compared with *nil* in the previous year; the next highest being 1·32 in the Belgaum district, an increase of ·76, and 1·01 in Mhow district, an increase of ·34. As usual the disability most observed was disordered action of the heart, which caused 407 admissions. Among the remainder were 159 admissions for valvular disease of the heart, 93 for varix, 22 for phlebitis, 20 for thrombosis, 13 for aneurysm, and 5 each for hypertrophy of the heart and phlegmasia dolens. The deaths were 14 from valvular disease of the heart, 8 from aneurysm, 3 from fatty degeneration of the heart (1 out of hospital), 2 from endocarditis, 2 from rupture of artery (both out of hospital), 1 from embolism, 1 from thrombosis, 1 from rupture of the heart (out of hospital), and 1 from dilatation of the heart. The deaths of invalids were 1 from valvular disease of the heart, and 1 from aneurysm.

Diseases of the Respiratory System.—There were 1,517 admissions and 32 deaths (2 of the latter occurring in invalids), giving ratios of 25·1 and ·53 per 1,000, which show decreases of 3·9 and ·25 respectively, when compared with the corresponding ratios for the preceding year, while the admission ratio is 7·3 and the mortality ratio ·37 lower than the decennial average rates. The average number of men constantly sick was 95·10, being in the ratio of 1·57, as compared with 1·74 in 1899, and 1·83 the ten years' average rate. The highest admission ratio was 57·6 per 1,000 in the Sind district, which is an increase of 41·4 on the rate for the previous year. The next highest ratio was 42·1 in the Madras district, an increase of 18·5, followed by a ratio of 41·4 in the Sirhind district, an increase of 14·7. The lowest admission ratios were 7·3 in the Bangalore district, a decrease of 16·2; 10·4 in the Deesa district, a decrease of 8·7, and 15·8 in the Poona district, a decrease of 5·5. The highest death rate was 1·80 per 1,000 in the Nagpur district, an increase of ·90; the next highest being 1·72 in the Southern district, against *nil* in the previous year, and 1·25 in the Bombay district, an increase of ·18. Of the 1,517 admissions, 1,101 were for bronchitis, 227 for pneumonia, 77 for pleurisy, 40 for laryngitis, 26 for spasmodic asthma 14

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for broncho-pneumonia, 9 for hæmoptysis, 6 each for phthisis and emphysema, 4 for empyema, 2 each for adhesions of pleura and cirrhosis, and 1 each for aphonia, contraction of bronchi, and congestion of lung. The deaths were 24 from pneumonia, 2 from bronchitis, and 1 each from laryngitis, broncho-pneumonia, emphysema and pleurisy. The deaths of invalids were 1 each from pneumonia and empyema.

Diseases of the Digestive System.—There were 5,984 admissions and 127 deaths, the equivalent ratios being 96·8 and 2·10 per 1,000, the admission ratio being 11·9 lower, but the mortality ratio ·46 higher, than in the preceding year, while on comparison with the decennial average rates a decrease of 21·7 is observed in the admission ratio, but an increase of ·35 in the death rate. The average number of men constantly sick from these diseases was 278·99, giving a ratio of 4·61 per 1,000, as compared with 5·15 in 1899, and with 5·32 the average rate for the preceding ten years. The highest admission ratio was 195·0 per 1,000 in the Mhow district, an increase of 47·3 on the rate for the preceding year; the next highest being 130·1 in the Sirhind district, a decrease of 42·8, and 127·9 in the Southern district, a decrease of 21·7. The lowest admission ratios were 63·8 in the Rawal Pindi district, 64·5 in the Bundelkhand district and 73·6 in the Peshawar district, showing decreases of 23·3, 22·4, and 15·3 respectively. The highest mortality ratio was 6·21 per 1,000 in the Deesa district, an increase of 4·47; the next highest being 4·22 in the Rangoon district, an increase of 2·86, and the third highest was 4·03 in the Mhow district, an increase of 2·01. There was no mortality in the Peshawar and Nagpur districts. The lowest death rate amongst the other districts was ·66 per 1,000 in the Belgaum district, a decrease of 1·03; the next lowest being 1·15 in the Bundelkhand district, a decrease of ·11, and 1·18 in the Secunderabad district, an increase of ·13. The chief causes of admission were 1,662 for affections of the mouth and throat (including diseases of teeth and gums 325, sore throat 730, and tonsillitis 574), 1,480 for hepatic disorders (including congestion of the liver 664, hepatitis 345, jaundice 248, abscess of the liver 166, cholecystitis 40, and cirrhosis 22), 1,109 for diarrhœa, 536 for indigestion, 405 for piles, 302 for colic, 224 for inflammatory diseases of the intestines (including catarrhal inflammation 113, typhlitis 55, enteritis 36, and colitis 20), 89 for hernia, 56 for inflammation and 4 for ulceration of the stomach, 24 for fistula in ano, 24 for constipation, and 17 for peritonitis. The deaths were 95 from abscess of the liver, 6 from peritonitis, 5 from typhlitis, 4 from enteritis, 3 each from diarrhœa and cirrhosis of the liver, 2 each from ulceration of the stomach and hepatitis, and 1 each from gastritis, hæmatemesis, colitis, intestinal strangulation, congestion of the liver, acute yellow atrophy of the liver and cholecystitis.

Abstract XXIII shows the prevalence of and mortality from diarrhœa and hepatic diseases in the several districts, and Abstract XXIV the prevalence of and mortality from these diseases in each quarter of the year. The admission ratio for diarrhœa was 18·3, and the mortality ratio ·05, as compared with 17·7 and *nil* respectively in the preceding year. The highest admission ratios were 68·8 in the Mhow district, 41·6 in the Rohilkhand district and 29·9 in the Lahore district, showing increases of 38·8, 22·6 and 1·7 respectively. For the second year in succession there was no admission for diarrhœa in the Mandalay district. Amongst the other districts the lowest admission ratio was ·9 in the Southern district against ·7 in the previous year, the next lowest being 2·0 in the Belgaum district against 7·9, and 2·1 in the Rangoon district against 3·6. As usual the prevalence of the disease was greatest in the third quarter of the year, when the admission ratio was 8·2 per 1,000, followed by 4·1 in the second, 3·3 in the fourth, and 2·8 in the first quarter. There was one death in each of the first, second and fourth quarters.

The ratio of admission for hepatic diseases was 19·6, exactly the same as in 1899, and the death rate was 1·67 against 1·26 in the previous year. The highest admission ratio was 47·2 in the Southern district, an increase of 29·4, the next highest being 44·3 in the Rangoon district, an increase of 20·7, and the third highest was 35·5 in the Narbudda district, a decrease of 16·0. The highest admission ratios in the preceding year were in the Bangalore, Narbudda, and Madras districts. The lowest admission ratio was 5·0 per

1,000 in the Peshawar district, a decrease of 2·5, the next lowest being 5·4 in the Nagpur district, an increase of 1·8, and 10·1 in the Rawal Pindi district, an increase of ·9. The death rate from hepatic diseases was highest, 6·21 per 1,000, in the Deesa district, as compared with *nil* in 1899. The next highest mortality ratio was 4·22 in the Rangoon district, against 1·36 in the previous year, followed by a ratio of 3·38 in the Narbudda district against ·76 in 1899. There were no deaths in the Peshawar and Nagpur districts. Amongst the other districts the lowest mortality ratios were ·66 in the Belgaum district, against ·56 in the previous year, ·68 in the Sind district against *nil*, and ·77 in the Bundelkhand district against 1·26. With regard to the seasonal prevalence of hepatic diseases, the highest admission ratio, 5·9, occurred in the third quarter of the year, followed by 4·9 in the second, 4·5 in the fourth and 4·2 in the first quarter. The deaths were distributed as follows :—34, or ·58 per 1,000 of strength, in the fourth quarter, 23, or ·38 per 1,000, in the third quarter, 23, or ·37 per 1,000, in the first quarter, and 21, or ·34 per 1,000, in the second quarter.

Diseases of the Lymphatic System.—There were 1,491 admissions and 1 death. The admission ratio was 24·6 per 1,000, which is 2·0 lower than the previous year, and 7·9 below the decennial average. The death rate, ·02 per 1,000, is ·01 less than last year's and the average rates. The average number of men constantly sick was 178·72, giving a ratio of 2·95, which is lower by ·21 and ·78 in the two comparisons. The highest admission ratio was 71·8 per 1,000 in the Madras district against 56·2, also the highest ratio in the preceding year. The next highest ratios were 45·7 and 43·3 in the Rangoon and Secunderabad districts, showing increases of 16·7 and 20·2 respectively. The lowest admission ratios were 7·9, 8·8, and 9·9, in the Quetta, Sind, and Aden districts, showing decreases of 10·0, 8·1, and 28·5 respectively. 1,421 of the admissions were caused by diseases of the lymphatic glands, 50 by diseases of the spleen, 11 by inflammation of, and 1 by obstruction of lymphatic vessels, 7 by goître, and 1 by inflammation of the thyroid body. The fatal case occurred at Chakrata, and the cause of death was splenitis.

Diseases of the Urinary System.—There were 126 admissions and 7 deaths, the equivalent ratios being 2·1 and ·12 per 1,000, as compared with an admission ratio of 2·4 and a mortality ratio of ·19 in the preceding year, and with 2·0 and ·18 the corresponding decennial average rates. The highest admission ratio was 5·6 per 1,000, in the Bombay district, a decrease of 2·5, the next highest being a ratio of 5·2 in the Southern district, an increase of 1·5, and a ratio of 4·9 in the Allahabad district, an increase of 3·1. The highest mortality ratios were ·45, ·34, and ·29 in the Lahore, Rawal Pindi, and Meerut districts, as compared with ·22, ·17, and *nil* in the previous year. The admissions comprised 44 for nephritis, 28 for cystitis, 23 for incontinence of urine, 7 for hæmaturia, 5 each for retention of urine and hæmoglobinuria, 3 each for granular kidney and calculus in kidney, 2 each for pyelitis and albuminuria, and 1 each for perinephritic abscess, lithuria, calculus in the bladder, and irritability of the bladder. The deaths were 4 from nephritis, 2 from granular kidney, and 1 from perinephritic abscess.

Diseases of the Generative System.—The admissions for these diseases numbered 4,863, giving a ratio of 80·3 per 1,000, as compared with 78·5 in the previous year, and 84·9 the average for the preceding ten years. The average number of men constantly sick was 400·17, the ratio being 6·61 per 1,000, against 5·76 in 1899, and 6·34 the decennial average rate. The highest admission ratio was 194·6 per 1,000 in the Deesa district, an increase of 67·9 on the admission rate for the previous year ; the next highest ratio being 156·2 in the Narbudda district, a decrease of 10·3, followed by a ratio of 153·2 in the Bundelkhand district, an increase of 51·2. The lowest admission ratios were 19·0, 21·8, and 22·8 in the Aden, Bangalore, and Rohilkhand districts, showing decreases of 10·2, 6·1, and 11·7 respectively. As in preceding years soft chancre, already referred to under venereal diseases, was the cause of the majority of the admissions, which numbered 4,042 ; and among the remainder, the chief causes of admission were 412 for orchitis, 108 for ulcer of the penis, 98 for balanitis, 54 for stricture of the urethra, 26 for phimosis, 7 for paraphimosis, 30 for hydrocele, 22 for varicocele, and 21 for epididymitis.

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Diseases of the Organs of Locomotion.—There were 646 admissions, giving a ratio of 10·7 per 1,000, which is 1·0 lower than in 1899, but 1·0 higher than the decennial average rate. The average number of men constantly sick was 43·67, giving a ratio of ·72 per 1,000, against ·93 in the previous year, and ·74 the average rate for the preceding ten years. The highest admission ratios were 23·2 per 1,000 in the Southern district, an increase of 10·6; 19·8 in the Mhow district, a decrease of 3·8, and 18·8 in the Bombay district, an increase of 5·9. The three lowest ratios were 3·9 in the Quetta district, showing a decrease of 8·2; 4·4 in the Bangalore district, a decrease of 2·4, and 6·2 in the Deesa district, an increase of 4·5. The chief causes of admission were synovitis 356, myalgia 96, periostitis 33, bursitis 24, hammer toe 22, and dislocation of articular cartilages 21.

Diseases of the Connective Tissue.—There were 1,198 admissions and 2 deaths, giving admission and death rates of 19·8 and ·03 per 1,000, as compared with 23·0 and *nil* in the previous year, and with 22·6 and ·01 the decennial average rates. There were 63·98 men constantly inefficient from these diseases, the ratio being 1·06 per 1,000, against 1·05 in 1899 and 1·09 the average rate. The three highest admission ratios were 33·5 in the Madras district, showing a decrease of 1·0; 31·6 in the Belgaum district, an increase of 11·3, and 28·8 in the Rangoon district, an increase of 6·1. The three lowest ratios were 6·8 in the Rohilkhand district, a decrease of 3·8; 9·8 in the Quetta district, a decrease of 19·3 and 10·4 in the Deesa district, an increase of 1·7. The causes of admission were abscess 713, inflammation 480, œdema 3, emphysema 1, and undue formation of fat 1. The two deaths occurred at Rangoon and Solon, the cause of death in each instance being inflammation of the connective tissue.

Diseases of the Skin.—There were 2,706 admissions and 1 death, the equivalent ratios being 44·7 and ·02 per 1,000, as compared with 56·3 and *nil*, and with 58·1 and *nil* last year's and the decennial average rates respectively. The average number of men constantly sick was 129·04, giving a ratio of 2·13 as compared with 2·36 in 1899, and with 2·49 the average rate for the preceding ten years. The highest admission ratio was 103·1 per 1,000 in the Aden district, showing an increase of 36·4 on the rate for the previous year, the next highest ratios being 86·4 in the Nagpur district and 69·9 in the Madras district, showing decreases of 1·4 and 39·8 respectively. The three lowest ratios were 15·7 in the Quetta district, a decrease of 18·4; 31·1 in the Presidency district, a decrease of 48·0, and 31·2 in the Rohilkhand district, a decrease of 8·4. The chief diseases were boils 1,131, ulcers 526, eczema 322, onychia 196, whitlow 195, herpes 51 (including 17 cases of zona), pemphigus 42, psoriasis 37, wen 35, impetigo 26, prickly heat 25, corns 24 and urticaria 21. Death occurred in a case of carbuncle at St. Thomas' Mount.

INJURIES.—There were 5,567 admissions and 94 deaths. The admission ratio was 91·9 and the death rate 1·56 per 1,000, as compared with 104·6 and 1·61 in the previous year, and with 102·5 and 1·97 the corresponding average rates for the preceding ten years. The average number of men constantly inefficient from injuries was 265·59, giving a ratio of 4·39 per 1,000, as compared with 4·64 in 1899 and 4·72 the decennial average rate.

General injuries caused 201 of the admissions and 64 of the deaths, as against 251 and 57 in the year before. The admissions comprised 95 cases of heat-stroke, 67 of heat-apoplexy, 12 of sun-stroke, 12 of multiple injury, 10 of burns and scalds, 3 for the effects of chemical irritants and corrosives, and 2 of suffocation from submersion. The deaths were 32 from heat-apoplexy (8 out of hospital), 17 from suffocation from submersion (16 out of hospital—11 accidental, 3 suicidal and 3 uncertain), 7 from heat-stroke (4 out of hospital), 5 from multiple injury (1 out of hospital), 1 from sun-stroke, 1 from the effects of chemical irritants and corrosives, and 1 (out of hospital) occurred at Quetta from suffocation from plugging of the air passages, caused by particles of vomited matter (undigested food) finding their way into the trachea and bronchi in the case of a man who went to bed under the influence of alcohol.

Local injuries caused 5,356 admissions and 30 deaths. The chief causes of admission were strains and sprains 1,595, wounds 1,436, contusions 1,315, abrasions 543, fractures 283 (including fractures of skull 8, and of spine 2),

dislocations 51 (including 1 of dislocation of the fibula and foot with fracture), gunshot wounds 46, burns and scalds 45, and concussion of the brain 24. The deaths were 10 from gunshot wounds (8 out of hospital—7 suicidal, 2 homicidal, 1 uncertain), 9 from fracture of the skull (3 out of hospital—8 accidental, 1 homicidal), 4 from wounds (2 out of hospital—1 homicidal), 2 from fracture of the spine, 1 from dislocation of the spine with fracture (judicial), and 1 each from concussion of the spinal cord, contusion of abdomen with rupture of viscera, rupture of the spleen and rupture of the urethra.

There were 17 cases of suicide as compared with 23 in 1899; but in three of the cases, men found drowned, it is not absolutely certain that the deaths were suicidal. Of the 17 cases, 7 were deaths from gunshot wounds, 6 from suffocation from submersion, 3 from cut throat, and 1 from poisoning by cyanide of potassium. The following were presumed causes in six of the cases:—"family troubles"; "tired of life"; "epilepsy and disappointment in love"; "under the influence of liquor and had been refused admission to the theatre for being improperly dressed"; "mental depression and moroseness owing to his having had orders to remain for another year in the Tochi valley"; "had previously shown hypochondriacal symptoms, due to his having suffered for a long time from gonorrhœal rheumatism." No motive could be assigned in the remainder of the cases, and the verdict for all was that the acts were committed while temporarily insane. Two of the men were 22 years of age, three 23, two 24, one 25, two 26, two 27, two 28, two 29, and one 34 years of age. With regard to length of service, one was of 2 years' service, three of 3, two of 4, two of 5, two of 6, four of 7, one of 9, and one of 19 years' service, and in one instance the length of service was not stated

There were 23 cases of self-inflicted injuries or attempts at suicide. These comprised 16 wounds of the throat (13 with razor and 3 with knife), 4 attempts at hanging, 2 gunshot wounds and 1 attempt at strangulation by tying a punkah rope round the neck. In three of the instances the men were under the influence of drink when they inflicted the injuries, and five others were known to be of intemperate habits. Three of the attempts were made in prison; in one instance the man stated that he was tired of life, and in another, where hanging was attempted, the presumed motive was "to get out of the army, the man having every reason to suppose he would be cut down before he was dead." Another of the attempts was made while the man was a prisoner in his quarters owing to irregularities through drink. Other presumed motives were:—having received a sentence of imprisonment; mental depression (2); depression owing to cholera having broken out in the station. No motives were assigned for the attempts in the other cases.

Poisons caused 103 admissions and 10 deaths. The following were the causes of admissions:—Poisoning by copper, lead, mercury, alcohol and chloroform vapour, of each 1 case; ptomaine poisoning 11 cases, decayed and poisonous food 4 cases, and poisonous fungi 2 cases; poisoned wounds 81 (comprising wounds by dogs 69, by stinging insects 2, by snake 1, by fish 1, by leopard 1, by monkey 1, by bite of a man 1, and wounds poisoned by vegetable substances 3 and by septic matter 1, and from metal buckle 1). The deaths were due to poisoning by lead 1, by cyanide of potassium 1 (out of hospital), by alcohol 2 (1 out of hospital), by chloroform vapour 1, by poisonous fungi 1, and by ptomaine poisoning 4. The death from chloroform occurred at Mhow during an operation for varix. The deaths from ptomaine poisoning took place at Lucknow, Mian Mir and Secunderabad. In one of the cases of alcohol poisoning the man died in the road at St. Thomas' Mount, and in the other case at Agra, death resulted from drinking a considerable quantity of native rum. The death from eating poisonous fungi occurred at Lucknow, and the fatal case of lead poisoning at Fatehgarh, while the death from poisoning by cyanide of potassium was that of a man who committed suicide at Hyderabad.

Surgical Operations.—The number of operations recorded for the year was 459, and of deaths following operation 67. There were 18 operations for the removal of tumours and cysts with 16 satisfactory results. The two

unsuccessful operations occurred in the same case, one of angioma of the conjunctiva, in which the growth was twice removed from the eyeball by dissection and actual cautery, but it recurred a third time, and the man was invalided. In 9 cases deep seated abscesses were evacuated; seven of the patients returned to duty, one died subsequently of tubercular disease of the hip joint, and one was invalided. There were several successful operations for the removal of foreign bodies from different parts of the body, one of the instances being the removal of a foreign body from the right knee joint. The ulnar artery was ligatured for wound of the deep palmar arch caused by a fall on broken glass. Twelve cases of varix were successfully treated by operation, either by excision of one or more pieces of vein or by ligature in one or more places. The operations on lymphatic glands numbered 125, and of these 105 were excisions of enlarged inguinal glands, venereal in origin, from both groins in some instances, and the results reported were that 103 returned to duty, and 2 were invalided. Tubercular glands were removed from the neck in two cases, successfully in both so far as the operation was concerned, but one man's unsatisfactory state of health necessitated his being invalided. In a case of soft chancre at Rangoon, circumcision was performed and both groins were incised and scraped, a quantity of foul necrotic tissue and diseased glands being removed, but the man died two months later from beri-beri. An un-united fracture in the middle third of the left femur was cut down on and wired, but although improvement followed, the case necessitated invaliding. Amputations through the right thigh, through the surgical neck of the humerus, and through the middle third of the forearm, were required in three cases of fracture, and amputation through the middle of the thigh was performed for sarcoma of the patella. In all four cases good results followed, the men being invalided. There were also 18 cases of amputation of toes and 10 of fingers. Hammer toe was treated in two instances by excision of the first inter-phalangeal joint of the affected toes with satisfactory results, but the operation usually performed was amputation, by which method 15 cases were successfully treated. The left thumb was amputated at the metacarpo-phalangeal joint in a case where the man had been mauled by a panther, but septicæmia set in as the result of the multiple injuries received, with a fatal result. Trephining was performed in a case of abscess of the brain, but the man died two days later. There were 4 cases of excision of the eye-ball, 2 for wound and 2 for ophthalmia, one the latter being gonorrhœal in origin. In 4 cases of empyema incision and free drainage of the pleural cavity was practised, with 2 recoveries and 2 deaths. There were 103 operations on the abdomen, of which 85 were for abscess of the liver, with 27 successful results and 57 deaths. In one case the result was not stated. Of the 27 successful cases, 8 men returned to duty, 18 were invalided, and one recovered from abscess of the liver but died from enteric fever, which supervened. The operation performed in 78 of the cases was free incision and drainage (a portion of a rib being resected in 10 instances) with 26 recoveries, 51 deaths and result not stated in one case; in the remaining 7 cases aspiration alone was performed with only one satisfactory result. Among the other abdominal operations were 6 for the radical cure of hernia, all of which yielded good results; 4 for typhlitis, in which the abdomen was opened in the right iliac region and the abscesses drained, with 3 recoveries and 1 death; and aspiration in 5 cases of hepatitis, 4 of which terminated satisfactorily and 1 died. There were 24 operations on the rectum and anus, comprising 12 for piles, 7 for fistula, 3 for ulcer of the rectum, 1 for fissure of the anus and 1 for periproctitis. Of the remaining operations the chief were, circumcision 49, radical cure of hydrocele 7, castration 4, varicocele 2, for retained testicle 1. Urethrotomy was practised in a case of extravasation of urine, but the case terminated fatally.

Chloroform was the anæsthetic generally employed, cocaine being used in a few cases, and ethyl chloride in one instance.

INVALIDING.—The total number of men invalided was 2,026, of which number 2,020 were sent home and 6 were discharged as invalids in India.

The invaliding ratio was 33·46 per 1,000, which is 1·89 higher than in 1899, and 4·96 above the decennial average rate. *India.*

Taking the invaliding in the different arms of the service as shown in Abstract XXX, and including the six men who were discharged locally in the Command, it is found that the invaliding ratio in the cavalry was 29·58 per 1,000, showing a decrease of 4·87 as compared with the ratio for the preceding year, in the artillery the ratio was 40·72, an increase of 1·26, and in the infantry it was 32·99, an increase of 1·82.

Tables and charts showing the influence of age and length of service on sickness, mortality, and invaliding, have already been given, and it will be observed that, as in preceding years, the invaliding ratio was highest, 48·92 per 1,000, among men of over 40 years of age, and lowest 21·17 per 1,000, as is usual in men under 20 years, but the latter ratio shows the large increase of 10·53 when compared with the ratio for the under 20 years group in 1899, while a decrease of 2·80 is observed in the ratio for men over 40 years of age. As in the four previous years the second highest invaliding ratio, 39·71, occurred among the men between 20 and 25 years of age, followed by 34·67 for men between 35 and 40, 30·87 for those in the 25 to 30 years group, and 22·08 for men between 30 and 35 years of age. These four groups occupied the same order in the preceding year, but the ratios of the three first mentioned are higher than in 1899, the increases, in the order in which the groups are given, being 1·83, 4·19, and 3·01, while for the 30 to 35 years group a decrease is observed of 2·79. With regard to the influence of length of service in the country on invaliding, the invaliding ratio was highest among men in their first year of service in India, namely 67·08 per 1,000, which is also very much higher than the corresponding ratio in 1899, namely 29·10 per 1,000. In the two preceding years the highest invaliding rate occurred among men in their second year of Indian service. An increase in the proportion of invaliding is also observed among men in their second year of service, the invaliding ratio being 47·73 as compared with 39·29 in 1899. The ratios, however, for the third, fourth, and fifth years of service in the country, 30·12, 27·30, and 26·05, are lower than the corresponding ratios in the preceding year, namely 35·58, 28·37, and 31·51. The third highest invaliding ratio was 31·17 for men of between 5 and 10 years' service in India, and this ratio is slightly higher than that of the previous year when it was 30·18. Among the men having over 10 years' service the invaliding ratio, 27·92, shows but little change when compared with 27·40 the corresponding ratio in the preceding year.

As usual, the cause of invaliding which stands first was secondary syphilis, for which disease 344 men were invalided (as compared with 417 in 1899, 547 in 1898, and 611 in 1897), giving a ratio of 5·68 per 1,000, as compared with 6·16 and 5·19 last year's, and the decennial average rates respectively. Diseases of the circulatory system caused the invaliding of 241 men (including 107 cases of disordered action of the heart, 93 cases of valvular disease, and 22 cases of varix), the invaliding ratio being 3·98 per 1,000, against 3·34 the ratio for 1899, and 2·76 the average rate. Debility comes next with 216 against 196 invalids in the previous year, the ratio being 3·57 as compared with 2·90 in 1899, and with 3·03 the average invaliding ratio for the preceding ten years. There were 190 men invalided for malarial fevers, against 246 in the previous year, giving a ratio of 3·14 as compared with 3·63 last year, and with 3·02 the decennial average. Diseases of the digestive system caused the invaliding of 164 men against 175 in 1899 (including 27 for abscess of the liver, 25 for hepatitis, 17 for congestion of the liver, and 30 for hernia), the invaliding ratio being 2·71 against 2·59 and 2·0 in the two comparisons. There were 65 men invalided for nervous diseases, and 77 for mental diseases, making a total of 142 men invalided for diseases of the nervous system, the combined ratio being 2·34 as compared with 2·28 last year, and 2·20 the decennial average rate. There were 102 invalids for tubercular diseases (including 94 for tubercle of the lung) giving a ratio of 1·68 against 1·23 and 1·70 in the two comparisons. Rheumatism caused the invaliding of 73 men, the ratio being 1·21 against ·89 in the previous year, and ·98 the decennial average rate. There were 69 men invalided for diseases of other organs of special sense (including 39 for perforation of the membrana tympani, 14 for inflammation of the middle ear, and 12 for deafness), giving a ratio of 1·14

a. as against 1·03 in 1899, and a decennial average rate of ·92. 67 men were invalided for dysentery, the ratio being 1·11 against 1·43 and 1·12 in the two comparisons; 60 for local injuries (including 20 cases of fracture, 12 of wounds, and 9 of gunshot wounds), the ratio being ·99 against ·96 and ·95 in the two comparisons; 55 for diseases of the organs of locomotion (including 19 cases of synovitis), giving a ratio of ·91 against ·81 and ·84; 48 for diseases of the respiratory system (including 13 for bronchitis and 9 for pneumonia), the ratio being ·79 against ·58 and ·54; 45 for diseases of the eye, a ratio of ·74 as compared with ·72 and ·53; 36 for enteric fever, giving a ratio of ·59 against ·78 and ·50; 35 for gonorrhœa, the ratio being ·58 as against ·27, and an average rate also of ·27; 33 for other general diseases (including 20 cases of anæmia and 7 of diabetes mellitus), giving a ratio of ·54 against ·34 and ·48; 17 for diseases of the urinary system (including 8 for nephritis and 4 for cystitis) the ratio being ·28 against ·43 and ·33; and 15 for diseases of the generative system (including 8 cases of stricture of the urethra), giving a ratio of ·25 against ·18 and ·23.

There were 677 men discharged the service as medically unfit for further service, the equivalent ratio being 11·18 per 1,000, which is below the previous year's rate by 3·12, and the average rate by 3·70. The principal causes of discharge were malarial fevers 14 cases, or ·23 per 1,000; tubercular diseases 49 cases, or ·81 per 1,000; secondary syphilis 59, or ·97 per 1,000; rheumatism 23, or ·38 per 1,000; debility 27, or ·45 per 1,000; diseases of the nervous system 175, or 2·89 per 1,000 (including 117 cases, or 1·93 per 1,000, of mental disorder); diseases of the eye 17, or ·28 per 1,000; diseases of the organs of special sense 32, or ·53 per 1,000; circulatory diseases 159, or 2·62 per 1,000 (including 104 cases of valvular disease and 43 of disordered action of the heart); diseases of the respiratory system 11, or ·18 per 1,000; diseases of the digestive system 28, or ·46 per 1,000; diseases of the urinary system 9, or ·15 per 1,000; diseases of the organs of locomotion 16, or ·26 per 1,000; and injuries 34, or ·57 per 1,000. In comparison with corresponding ratios for the previous year, decrease of ratio is observed principally in secondary syphilis (1·31), debility (·41), injuries (·34), and malarial fevers, diseases of the eye, and diseases of the organs of special sense (·27 each); increase only being noticeable under diseases of the nervous system (·82), and rheumatism (·07).

Officers.—The average strength of officers for the year was 1,780, the number of attacks of illness 1,447, the number of deaths 26, and the number invalided to England 140. The ratio of sickness was 812·9 per 1,000, the death rate 14·61, and the invaliding rate 78·65. Compared with the corresponding ratios in the previous year, increases of 45·1, ·98, and 12·09 are observed in the admission, death, and invaliding ratios respectively. There were 13 cases of *eruptive fevers* with 1 death, as compared with 14 cases in 1899, comprising 6 of small-pox (1 fatal), 6 of measles and 1 of cow-pox. The fatal case of *small-pox* occurred at Poona, and the other cases, 1 each at Benares, Peshawar, Sialkot, Secunderabad, and Kamptee. In the Sialkot case the disease was contracted in a *serai* while on a staff ride near Rawal Pindi; the origin could not be traced in the other cases. There were 26 cases of *influenza*. *Enteric fever* occurred in 39 cases and 9 deaths resulted, as compared with 55 cases and 10 deaths in 1899. The admission ratio for enteric fever was 21·9 per 1,000, against 28·8 in the previous year, and as compared with an admission ratio of 16·0 per 1,000 among the warrant officers, non-commissioned officers and men during the year under report, while the death rate was 5·06 per 1,000 as compared with 5·24 in the preceding year, and 4·77 the death rate among the warrant officers, non-commissioned officers and men. The percentage of mortality to attack was 23·07 as compared with 18·18 in 1899, and with 29·8 the percentage of mortality to attack among the warrant officers, non-commissioned officers and men during 1900. One case occurred on the line of march, and the remaining cases were distributed over 23 stations as follows:—4 cases at Lucknow, 3 cases and 1 death each at Kasauli and Rangoon, 3 cases at Rawal Pindi, 2 cases and 1 death at Mian Mir, 2 cases each at Fort William, Jhansi, Poona, Kirkee, and Nasirabad, 1 fatal case each at Agra, Umballa, Wellington, Shwebo, and Mhow, and 1 case each at Allahabad, Ranikhet,

Landour, Jutogh, Nowshera, Bangalore, Secunderabad, and Quetta. The remaining death occurred at Bhagalpore, which is not a military cantonment for European troops. *Simple continued fevers* contributed 98 cases, giving a ratio of 55·1, a decrease of 18·3 on the rate of the preceding year. There were 3 fatal cases of *cholera* at Poona; the disease was prevalent at the time but the direct source of these three cases could not be discovered. There were 47 cases of *dysentery*, giving a ratio of 26·4 as compared with 28·3 in the in the previous year; one of the cases proved fatal, the officer being away from his corps at the time of death. *Malarial fevers* (including 419 cases of ague and 51 of remittent fever) gave a ratio of 264·0 per 1,000 against 180·3 in 1899. *Venereal diseases* (including 11 cases of gonorrhœa, 4 of primary and 1 each of secondary syphilis and soft chancre) gave an admission ratio of 9·6 as compared with 8·3 in the previous year. *Parasitic diseases* caused 2 admissions, 1 case each of tænia solium and culex anxifer, furnishing a ratio of 1·1. *Rheumatism* (including 14 cases of rheumatism, 2 of gout and 1 of rheumatic fever) gave a ratio of 9·6, showing an increase of 3·8. *Debility* furnished 38 cases, the ratio being 21·3, an increase of 10·8. Included under *other general diseases*, there was one case of scirrhus carcinoma, and 1 fatal case of purpura. There were 13 cases (1 fatal) of *diseases of the nervous system*, giving a ratio of 7·3, a decrease of 1·6; the diseases furnishing this ratio were 6 of neuralgia and 1 each of neuritis, hæmatomyelia (fatal), meningitis, sanguineous apoplexy, hyperæmia of the brain, hemiplegia and local paralysis. Under *mental diseases*, there was 1 case of melancholia (invalided). *Diseases of the eye* contributed 15 cases (comprising conjunctivitis 12 and 1 each of iritis, amblyopia and stye) giving a ratio of 8·4 which is exactly the same as last year. There were 10 cases of *diseases of other organs of special sense*, namely, 6 of inflammation of the external ear, 3 of inflammation of the middle ear and 1 of deafness, furnishing a ratio of 5·6 as against 3·1 last year. *Diseases of the circulatory system* caused 10 admissions and 2 deaths, giving ratios of 5·6 and 1·12 per 1,000 as compared with 3·7 and *nil* in the previous year; the diseases were 3 of phlebitis, 2 of thrombosis, 2 of disordered action of the heart, 1 fatal case each of valvular disease of the heart and of dilatation of the heart, and 1 case of pericarditis. There were 29 cases of *diseases of the respiratory system* (bronchitis 23, pneumonia 3, laryngitis 2, and spasmodic asthma 1) the ratio, 16·3, showing a decrease of 4·7. *Diseases of the digestive system* gave an admission ratio of 124·2 and a mortality ratio of 1·69, which show decreases of 13·1 and 1·45 respectively; the number of admissions was 221 and 3 deaths resulted, the chief disease being diarrhœa 55, congestion of the liver 41, indigestion 18, tonsillitis 17 sore throat 15, colic 11, jaundice 9, catarrhal inflammation of the intestines hepatitis and piles 8 cases each, typhlitis 6, gastritis 5 (1 fatal) and abscess of the liver 2 (both fatal). There were 17 cases of *diseases of the lymphatic system*, giving a ratio of 9·6, a decrease of 1·4. *Diseases of the urinary system* caused 6 admissions, the ratio, 3·4, showing a decrease of ·8, and there were 14 admissions for *diseases of the generative system*, the equivalent ratio being 7·9, an increase of ·6. There were 22 admissions for *diseases of the organs of locomotion* (including 18 cases of synovitis) giving a ratio of 12·4, a decrease of 7·5. There were 37 cases of *diseases of the connective tissue*, of which 31 were for inflammation and 6 for abscess. *Diseases of the skin* caused 53 admissions (including boils 25, eczema 10, ulcer 6, zona 3, and whitlow 3) the ratio, 29·8, showing a decrease of 3·2.

Among *general injuries* there were 6 cases of heat-stroke, 1 of heat-apoplexy and 1 of burns and scalds; the case of heat-apoplexy occurred at Colaba and had a fatal result, and there were two officers murdered, one at Möng Tum, a Chinese Shan town near the Burma frontier, and the other at Shabkadar. *Local injuries* contributed 214 cases (including strains and sprains 60, contusions 54, wounds 33, fractures 23, abrasions 15, dislocations 13, concussion of the brain 12, and compression of the brain 1); there was 1 death from fracture of the base of the skull. The admission ratio for local injuries, 120·2 per 1,000, shows an increase of ·7, and the mortality ratio, 1·69, a decrease of ·41. Under the heading of *poisons* there were 6 cases returned, comprising decayed and poisonous food 1, dog bite 4, and cat bite 1. The causes of *invaliding* were malarial fevers 28 cases, enteric fever 22, debility 16, dysentery 12, congestion of the liver 10, hepatitis 4, indigestion

typhlitis, diarrhœa and fractures 3 each, simple continued fever, syphilis, pneumonia, variocele, inflammation of the connective tissue, and dog bite 2 each, and small-pox, cyst, carcinoma, meningitis, sanguineous apoplexy melancholia, inflammation of the middle ear, deafness, ozœna, fatty degeneration of the heart, disordered action of the heart, thrombosis, gastritis, fissure of the anus, cirrhosis of the liver, gall stones, inflammation of the lymphatic glands, granular kidney, stricture of the urethra, inflammation of the prostate, synovitis, wen, Delhi boil, and concussion of the brain 1 each.

WOMEN.—The average strength was 2,908, the number admitted 2,331, and the deaths 51, giving admission and mortality ratios of 801·6 and 17·54 per 1,000, which are higher than the corresponding ratios in the previous year by 131·4 and 2·99 respectively. *Small-pox* was the cause of 15 admissions and 3 deaths as compared with 8 admissions in the previous year, the admission ratio, 5·2, showing an increase of 2·6; there were 2 cases with 1 death at Nasirabad, 2 cases each at Mhow and Secunderabad, 1 fatal case each at Deesa and Kamptee, and 1 case each at Fort William, Cawnpore, Agra, Dagshai, Peshawar, Poonamallee, and Deolali. *Other eruptive fevers* caused 11 admissions, of which 8 were cases of measles and 3 of chicken-pox, the admission ratio being 3·8 as compared with 3·6 in 1899. There were 14 cases of *influenza* and 1 of *diphtheria*. *Enteric fever* was the cause of 22 admissions with 7 deaths, against 18 admissions and 7 deaths in the preceding year, the admission rate 7·6 and the death rate 2·41 being respectively 1·8 and ·15 higher than in 1899. There were 2 fatal cases each at Secunderabad and Kirkee, 2 cases each at Ranikhet, Camp Thobba, Murree and Quetta, 1 fatal case each at Jullundur, Cherat and Mhow, and 1 case each at Meerut, Ferozepore, Rawal Pindi, Sialkot, Lower Topa, Rangoon and Poona. *Simple continued fever* caused 42 admissions, giving a ratio of 14·4 as compared with 13·3 in the previous year. *Cholera* was the cause of 5 admissions all of which proved fatal; 3 of the cases occurred at Mhow, 1 each at Allahabad, Secunderabad and Kirkee. *Dysentery* caused 49 admissions with 5 deaths, the equivalent ratios being 16·9 and 1·72 as compared with an admission rate of 20·7 and a death rate of ·97 in the previous year. *Malarial fevers*—427 cases of ague (3 fatal) and 30 cases of remittent fever (4 fatal)—gave admission and mortality ratios of 157·2 and 2·41 as compared with 123·2 and 2·59 in 1899. Under the heading of *septic diseases* are returned 4 cases of puerperal septicæmia (1 fatal) and 2 cases of erysipelas, the admission and death rates, 2·1 and ·34, being lower than in 1899 by 1·1 and ·63 respectively. There were 11 admissions for *tubercular diseases*, all cases of tubercle of the lungs, of which 2 proved fatal, an increase of 1·5 being observed in the admission rate and of ·37 in the death rate. There were 3 admissions for *secondary syphilis* against 5 in the previous year, or a ratio of 1·0 against 1·6. Under *parasitic diseases* 4 admissions for tænia solium, 3 for tænia mediocanellata and 1 for scabies are recorded. There were 3 cases of *alcoholism*. *Rheumatism* caused 27 admissions, of which 2 were cases of rheumatic fever, the ratio being 9·3 against 9·4 in 1899. 874 admissions and 1 death are recorded under the heading of *debility*, the admission ratio, 300·6, showing an increase of 54·6 on the rate for the preceding year. Under the heading of *other general diseases* are included 23 cases of anæmia, 4 of cyste, 2 of mumps, 2 of sarcoma, 1 of adenoma and 1 (fatal) of glandular carcinoma. *Diseases of the nervous system* furnished 31 cases comprising neuralgia 18, hysteria 8, epilepsy 2, puerperal convulsions 2 (both fatal), and spasmodic wryneck 1, the admission ratio being 10·7 against 11·0 in 1899. Under *mental diseases* 1 case of puerperal mania is returned. *Diseases of the eye* caused 34 admissions of which 29 were cases of conjunctivitis, 4 of iritis and 1 of blepharitis, the admission ratio being 11·7 against 7·8. *Diseases of the other organs of special sense* were the cause of 9 admissions, comprising 5 of inflammation of the external ear, 2 of inflammation of the middle ear, 1 of deafness and 1 of ozoena. There were 23 admissions and 6 deaths from *diseases of the circulatory system*, giving ratios of 7·9 and 2·06 as compared with 5·8 and 1·62 in the previous year; the causes of admission were valvular disease of the heart 10 cases (3 fatal), phlegmasia dolens and varix 3 cases each, phlebitis 2 cases, disordered action of the heart and embolism 1 case each, and 1 fatal case each of syncope,

thrombosis, and fatty degeneration of the heart. *Diseases of the respiratory system* gave an admission ratio of 18·6 and a death rate of 1·03, as compared with 16·8 and 1·29 in the previous year; the cases were 54 in number with 3 deaths, and included 45 of bronchitis, 4 of pleurisy and 3 of pneumonia; the fatal cases being one each of pneumonia, phthisis and empyema. *Diseases of the digestive system* caused 226 admissions and 5 deaths, giving admission and mortality ratios of 77·7 and 1·72 as compared with 59·5 and 1·94 in the previous year; the chief causes of admission were indigestion 57, diarrhœa 43, tonsillitis 23, sore throat 20, colic 20, congestion of the liver 10 and gastritis 10, and the deaths were due to diarrhœa 2, gangrene of the mouth 1, hepatitis 1 and acute yellow atrophy of the liver 1. *Diseases of the lymphatic system* furnished 2 cases of goître, 1 of splenitis and 1 of hypertrophy of the spleen. *Diseases of the urinary system* caused 11 admissions and 1 death, comprising 6 cases of nephritis, 2 of inflammation of the bladder, 1 of granular kidney (fatal) and 1 each of pyelitis, and incontinence of urine. There were 280 admissions and 3 deaths from *diseases of the generative system*, including 93 for abortion, 25 for metritis, 25 for metrorrhagia, 23 for menorrhagia, 14 for spurious labour pains, 10 for inflammation of the ovary, 9 for ulcer of the uterus, 9 for uterine hemorrhage, 5 for retroversion of the uterus, 5 for puerperal mastitis, and 5 for dysmenorrhœa, the deaths being due to metritis, ulcer of the uterus and sudden death after delivery; the admission and death rates were 96·3 and ·34 as compared with 87·3 and ·65 in the previous year. *Diseases of the organs of locomotion* contributed 4 cases of myalgia, 1 of periostitis and 1 of bursitis. *Diseases of the connective tissue* caused 14 admissions, of which 9 were due to abscess, 4 to inflammation and 1 to œdema. There were 28 admissions for *diseases of the skin*, of which 13 were for ulcers, 7 for boils, 3 for urticaria, and 2 for eczema. Of the 27 cases returned under *injuries* there was one fatal case of heat-stroke, 9 cases of strains and sprains, 8 of wounds, 6 of contusions, 3 of fractures, and 1 of abrasion. One case was returned as *no appreciable disease*.

CHILDREN.—The average strength was 5,376, the number of admissions 3,435, and the deaths 252. The admission ratio was 639·0 per 1,000, an increase of 111·9 on the rate for the previous year, and the death rate was 46·88 per 1,000, an increase of 5·79 *Small-pox* caused 7 admissions and 2 deaths, as compared with 1 admission in 1899, the equivalent ratios being 1·3 and ·37, against ·2 and *nil* in the previous year; 2 of the cases (1 fatal) occurred at Secunderabad, 1 fatal case at Poona, and 1 case each at Peshawar, Bombay, Karachi and Kamptee. *Other eruptive fevers* caused 407 admissions and 9 deaths, against 378 admissions and 10 deaths in 1899. The admission and mortality ratios were 75·7 and 1·67, against 68·7 and 1·82 in the preceding year. Of the cases 305 and 8 deaths were due to measles, 91 to chicken-pox, 5 and 1 death to rubella, 4 to scarlet fever, and 2 to cow-pox. *Influenza* caused 20 admissions and 1 death, as compared with 22 admissions and 1 death in 1899. There were 7 cases of *diphtheria* (4 fatal), against 5 cases (2 fatal) last year. *Enteric fever* was the cause of 25 admissions and 4 deaths, as compared with 27 and 2 in the preceding year; the admission ratio, 4·7, is ·2 lower than last year, but the death rate, ·74, is ·38 higher. The cases were distributed as follows:—4 (2 fatal) at Secunderabad, 3 at Kirkee, 2 at Lucknow, 1 fatal each at Delhi and Rawal Pindi, and 1 each at Dum Dum, Allahabad, Benares, Cawnpore, Agra, Solon, Kasauli, Khanspur, Murree, Bangalore, Poona, Mhow, Nasirabad and Deolali. There were 98 cases of *simple continued fever*, the ratio, 18·2, being ·2 over that of the previous year. *Dysentery* caused 111 admissions and 13 deaths, giving ratios of 20·6 and 2·42, as compared with 12·9 and 1·27 in the previous year. *Malarial fevers*—756 cases of ague (11 deaths), and 56 cases of remittent fever (8 deaths)—gave admission and mortality ratios of 151·0 and 3·53, against 97·3 and 2·18 in 1899. Under *septic diseases*, 4 cases of erysipelas with 3 deaths are returned. *Tubercular diseases* caused 17 admissions and 7 deaths, the equivalent ratios being 3·2 and 1·30, as compared with 3·1 and ·73 in the previous year; the cases comprised tubercle of lymphatic glands 1 (fatal), of the brain and its membranes 5 (4 fatal), of the intestines 4, of joints 2, of

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the lungs 1, of the peritoneum 1, of the lungs and intestines 1 (fatal), and general tubercle 2 (1 fatal). *Inherited syphilis* caused 2 admissions with 1 death. *Parasitic diseases* furnished 32 cases, including 15 of tænia solium, 5 of ascaris lumbricoides, 3 each of tænia mediocanellata and ringworm, 2 each of threadworm and scabies, and 1 each of pediculi capitis and oidium albicans. There were 4 cases of *rheumatism*. *Other general diseases* contributed 92 cases, the diseases included under this heading being anæmia 19, mumps 19, immaturity at birth 17, whooping-cough 10, phimosis 9, rickets 7, epidemic diarrhœa 6, cyst 1, Hodgkin's disease 1, diabetes mellitus 1, spina bifida (lumbar) 1, and congenital malformation of head and heart 1 ; and the fatalities were immaturity at birth 18 (one not shown as an admission), epidemic diarrhœa 5, rickets 2, anæmia 2, diabetes mellitus 1, spina bifida 1, and congenital malformation of head and heart 1. *Diseases of the nervous system* caused 48 admissions and 22 deaths, as compared with 55 and 32 in the previous year, giving admission and mortality ratios of 8·9 and 4·09, against 10·0 and 5·82 in 1899 ; 24 of the cases and 16 of the deaths were due to infantile convulsions, 6 with 3 deaths to cerebral meningitis, 5 to laryngismus stridulus, 4 to epilepsy, 2 to chorea, 2 to anterior poliomyelitis, 2 to multiple neuritis (both fatal), 1 to anæmia of the brain, 1 to pachymeningitis (fatal), and 1 spasmodic wryneck. *Diseases of the eye* caused 194 admissions, the ratio being 36·1, against 24·4 in the preceding year; the cases comprised 192 of conjunctivitis, and 2 of ulcerative keratitis. Under the heading of *diseases of the other organs or special sense*, there were 9 cases of inflammation of the external ear, 1 of inflammation of the middle ear, and 2 of coryza. *Diseases of the circulatory system* were represented by 3 cases of disordered action of the heart. *Diseases of the respiratory system* caused 430 admissions and 27 deaths, the admission ratio, 80·0, showing an increase of 12·0 and the death rate, 5·02, a decrease of 1·89, the diseases being bronchitis 392 cases with 13 deaths, pneumonia 26 with 10 deaths, laryngitis 7 with 3 deaths, croup 3 with 1 death, and spasmodic asthma 2. *Diseases of the digestive system* caused 617 admissions and 89 deaths, the admission and mortality ratios being 114·8 and 16·56, as compared with 96·2 and 13·09 in the preceding year, and the principal causes of admission were 263 cases of diarrhœa (42 deaths), 112 of disorders of dentition (20 deaths), 50 of catarrhal inflammation of the intestines (7 deaths, 32 of sore throat (1 death), 41 of tonsillitis (1 death), 25 of enteritis (11 deaths), 14 of colic (1 death), 13 of ulceration of the palate and fauces (3 deaths), and 13 of indigestion. The remaining deaths under this heading were 1 each from gastritis, intussusception and jaundice. *Diseases of the lymphatic system* contributed 8 cases, those of the *urinary system* 5, of the *generative system* 10, and of the *organs of locomotion* 3. *Diseases of the connective tissue* caused 22 admissions, 15 of abscess, and 7 of inflammation. There were 72 admissions for *diseases of the skin*, including boils 24, eczema 20, urticaria 9, impetigo 7, and ulcers 5. For *general injuries* there were 8 admissions, 4 being for burns and scalds (1 fatal), 2 for heat-stroke (1 fatal), and 2 for sun-stroke (1 fatal). *Local injuries* caused 84 admissions, which included wounds 24, contusions 19, fractures 16, burns and scalds 12, and strains and sprains 5. Under *poisons* there was one case of poisoned wound from the bite of a dog, and death resulted in a case of opium poisoning at Thobba. At Kuldanah in May, five children ate the pods and seeds of a plant growing on the hillside, and three hours later all suffered from symptoms of severe poisoning—severe vomiting and purging followed by symptoms of collapse—to which three of the cases succumbed. Although much trouble was taken the plant was not identified. It was stated to be a "colchicum," but the species could not be determined. Three of the cases (2 deaths) were the children of soldiers, and two (1 death) were the children of an assistant surgeon.

SANITARY CONDITIONS.

Bengal Command.

India.

The Principal Medical Officer, Surgeon-General W. A. Catherwood, M.D., A.M.S., remarks that the general health of the British troops in the command was "fair."

The ratio per thousand of strength of admissions for enteric fever was 13·61, compared with 22·56 in 1899, the decrease being chiefly due to two causes, viz., to the absence of drafts of young soldiers, and to the movements of troops to the hills being carried out at the beginning of March instead of the beginning of April, thus partially vacating stations in the plains before the advent of the usual spring outbreak of enteric fever at some of these stations. The admissions for this disease at Chakrata, Meerut, Lucknow, Agra, and Allahabad were 13, 17, 63, 19, and 17 respectively, compared with 74, 45, 82, 33, and 29 in the year 1899.

There was a satisfactory decrease in the number of admissions for venereal disease at several stations, owing, doubtless, to the working of the cantonment hospitals.

There were 21 admissions with 18 deaths for cholera among the British troops in the Command, but the disease never assumed an epidemic form.

There were no admissions for plague among the British troops.

The sanitary conditions affecting the health of the troops in the various stations are as follows:—

Presidency District.—*Calcutta.* Malarial fevers were very prevalent, chiefly among the men of the Royal Irish Rifles, and a large number of men were sent away to Meerut and various hill stations for change of air. The provision of mosquito nets with a view to the prevention of malarial fever has been recommended, and is now under consideration. Enteric fever caused only two admissions with one death, compared with five cases last year. Nine cases of plague occurred during the year amongst the native followers, chiefly in the lines at Hastings. The erection of quarters for the hospital store-keeper's establishment, Army Hospital Corps men, and assistant surgeons' servants, all of which are urgently required, has not yet been commenced. The chief sanitary defects noted are (*a*) the dual water supply in Fort William, (*b*) the disposal of sewage. As regards the former, which cannot be done away with, as the outlay required to use municipal water for all purposes would be very great, the danger is minimized as much as possible by having all taps distinctly labelled whether the water is intended for drinking or washing purposes. As regards the latter, namely, the emptying of kitchen waste water and urine into the cunette, which, during the hot weather, causes an offensive smell, a septic tank is in course of construction which, it is hoped, will remedy this defect. The fort is said to be overcrowded with buildings which impede ventilation, but as the accommodation is even now insufficient, their number cannot be well reduced. During the year there was slight overcrowding for a short time only while one of the barracks was being repaired.

Dum Dum.—The drainage of the bazar is still greatly in need of improvement. This is being carried out as rapidly as funds permit, about 500 more feet of the main drain having been completed during the year. Tanks and swamps exist in the vicinity of the cantonment, and the neighbouring *bastis* are noted as in their usual insanitary condition. Representations on these subjects have been made to the civil authorities. New cookhouses have been erected during the year for each block of barracks. They are stated to be excellent buildings, and are fitted with swing doors and wire gauze windows, which contrivances, however, the medical officer in charge does not think have appreciably lessened the number of flies inside. The station and family hospitals are very old, and during heavy rain the roofs leak. Separate

India.

wards for the use of warrant and non-commissioned officers are much needed, and also for insanes. The upper storey of the building was taken into use as an officers' ward during the year. It is equipped for two beds. The hospital milk is obtained through contractors. A shed is required in the hospital compound where the cows could be fed and watered as well as milked under supervision. There were 8 cases of enteric fever with 6 deaths, as against 6 cases and 3 deaths in the preceding year. Dysentery caused 44 admissions, as compared with 62 in 1899; four of the cases proved fatal. Ague was prevalent chiefly during the months of March and April, but the admission ratio was lower than in the previous year.

Barrackpore.—The health of the garrison was better than it has been for several years. The admissions for ague again showed a large decrease, being 201, as compared with 399 the previous year, and 621 in 1898. Enteric fever caused only 4 admissions against 6 in 1899, and dysentery only 50 admissions compared with 76 in the preceding year. The comparative freedom of the garrison from ague is interesting, as the rainfall was unusually heavy. The medical officer in charge of the station hospital thinks that possibly the floods in September contributed towards this diminution by washing out the breeding-places of the anopheles mosquito. The new drainage scheme, which was completed a year ago, worked well, but requires further extending, as parts of the station are still very damp. The native infantry lines are particularly damp, and the floor of the barracks of the left wing and drummers' quarters, which are only composed of mud, require tiling. Steps are being taken to prevent the surplus water from the rice cultivation in the neighbourhood from flowing through the cantonment, and also to attend to the plantain gardens, which at present are too close to the barrack wash-houses. An incinerator is badly wanted during the rains, when the ground becomes water-logged and trenching for disposal of excreta difficult. The followers' lines of the Artillery have been condemned, and are being rebuilt on a more sanitary site. Work on the new station and family hospitals is proceeding.

Darjeeling.—The elevation of this station, which consists of the convalescent depôt at Jalapahar and Katapahar, where, until recently a mountain battery was quartered, is considered too great for convalescents, being nearly 8,000 feet. The barracks at Katapahar, being situated on the top of the ridge, are much exposed and very cold in winter The general health of the garrison was better than in the preceding year. Ague furnished the largest number of admissions, 54, but this was only about half the number of cases admitted, for the same disease in 1899. Enteric fever caused only one admission as compared with two last year. The surface drains in the depôt have not yet been cemented, but the necessity for this improvement has been recorded. The provision of hot water in barracks for the baths of convalescents has not yet been carried out. No other sanitary defects were noted.

Lebong.—The situation of this station is excellent, the elevation being about 6,000 feet. It is intended to increase the barrack accommodation so as to hold a whole battalion. At present only a wing can be quartered here. The only defect noticed is the want of a separate cookhouse and attendants' room for the infectious diseases hospital, the absence of which renders complete isolation impossible. There were only two deaths during the year, both due to tubercle of the lungs. No case of enteric fever occurred.

Fort Fulta.—There was no sickness amongst the garrison, the average annual strength of which was 8 during the year, although the surrounding country is low and swampy. No sanitary defects were brought to notice.

OUDH DISTRICT.—*Lucknow.* The number of admissions for enteric fever has again decreased, being 63 with 15 deaths, as compared with 82 cases and 22 deaths the preceding year. Amongst officers 4 cases occurred, and 2 amongst the children. None of these cases proved fatal. The admission ratios per 1,000 for 1900 and 1899 were almost the same, being 31·4 and 33·2 respectively; 14 of the 62 cases admitted had been inoculated against enteric fever. The admission rate amongst the inoculated was lower than in those not inoculated. The death rate amongst the former was 21·4 per cent. as compared with 16·3 amongst the latter, an unsatisfactory result when compared with last year's figures. The numbers, however, this year

are much smaller, and the results proportionally less reliable. The type of the disease generally was severe. The largest number of admissions (16) occurred in April, while in January there were 12 cases, and in each of the remaining months there were a few admissions. Dysentery furnished only 47 cases, as against 88 last year, while the admissions for malarial fever were 488, as compared with 329 in the previous year. This unusual prevalence of malarial fever was attributed to the abnormal rainfall in September. Venereal diseases (except gonorrhœa) showed a diminution.

The municipal water obtained from the river Gumti was used throughout the year. The objectionable position of the intake pipe, alluded to in last year's report, has not yet been rectified by carrying it further up the river above the nullah into which the drainage of several villages flows, though the matter has been brought to the notice of the authorities concerned. Milk and butter are supplied by the Government dairy farm. The latter is of excellent quality, and no complaints have been made about the former since the beginning of the year. The accommodation was sufficient, except that for married sergeants in the British Cavalry, and an estimate has been prepared to increase this.

The question of improving the condition of an insanitary drain leading from the sadr bazar is again under consideration, and it is hoped that something will soon be done. As part of the drain runs through the civil lines, united action between the cantonment and civil authorities is necessary. During the year *dhobies'* washing tanks with water laid on, and masonry platforms for fruit-sellers in the sadr bazar, were constructed.

The erection of a cantonment bakery is to be undertaken next year.

Fyzabad.—The general health of the garrison was better than in either of the two preceding years. There were only two cases of enteric fever with no deaths, compared with six cases and three deaths last year. One case of cholera occurred amongst the troops, and also 12 cases in the Wesleyan mission school. The outbreak in the school was attributed to polluted water. The majority of the wash-houses have no tanks fitted with pipes and taps for storing the water. This deficiency has been represented. The general sanitary condition of the station is very satisfactory, and no defects have been brought to notice.

Sitapur.—The general health of the garrison compares very favourably with the preceding year, the ratio of admissions per 1,000 and the average number constantly sick both showing a large decrease. No case of enteric fever occurred. The latrine troughs, which were complained of last year, have been renewed, and are now easily kept clean and sweet. The incinerator continues to work very satisfactorily, but only the solid filth is burnt, the urine and waste water being buried in trenches as heretofore. A separate kitchen for the station family hospital has been sanctioned, but not yet built. The cookhouse required for the infectious diseases ward is being supplied. There were no sanitary defects noticed.

Fatehgarh.—Malarial fever was very prevalent during August to November, but very few of the cases were serious ones. Quinine was issued prophylactically with good results. No case of enteric fever occurred during the year. A well is required for the Commissariat bakery, and some of the latrines in cantonments are in a very dilapidated condition. The construction of the former is to be proceeded with, and the latter will be renovated as soon as possible. Additional latrine accommodation has been provided in the fort, and is now satisfactory. The native sellers of pork and bacon are being compelled to provide proper houses for the storage of these articles, which hitherto have been kept in their houses, an arrangement which is considered objectionable on sanitary grounds.

Cawnpore.—The chief sanitary defect is the bad drainage of the native cavalry and infantry lines. The latter, too, are in very bad order, but as they stand first on the list for reconstruction, it is hoped this will be very shortly taken in hand, when the drainage can be remedied. A fresh site for them has also been recommended. The drainage of the neighbouring civil bazars is said to be defective. The water supply, which is abundant and of good quality, is obtained from wells, for the chief of which pumps are now being provided. The new Government dairy is working well, the

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milk and butter supplied being of good quality. The general health of the garrison was exceptionally good. Enteric fever caused 10 admissions with no deaths, as compared with 14 cases last year. Six of the cases contracted the disease outside the station. The admission rate for venereal disease was lower than in any of the preceding nine years. The working of the cantonment hospital is considered to have assisted in lessening the prevalence of this disease. Fourteen cases of cholera occurred during May in the native cavalry lines. The disease was attributed by the district sanitary officer to the consumption of melons, which are manured with human ordure. The supply of melons was accordingly stopped, and the outbreak ceased.

ALLAHABAD DISTRICT.—*Allahabad.* The general sanitary condition of the station is very satisfactory, the defects noticed in last year's report having been remedied. The pipes conveying the municipal water supply have not yet been extended to the barracks, but the cost of this work is to be included in the next year's budget. Flies are stated to have been a great pest, caused, it is supposed, by the proximity of the Government Grass Farm. The general health of the garrison showed a great improvement compared with previous years. There were only 17 admissions for enteric fever, compared with 29 and 49 respectively in the two preceding years. Five of the cases terminated fatally, 12 of the cases occurred in the months March to May. The origin of the disease could not be traced, but it is believed to be generally contracted in the bazars. Ague was extremely prevalent from September to the end of the year, nearly all the cases coming from the Northamptonshire Regiment, which had previously been stationed at Peshawar. There was a marked decrease in the number of admissions for venereal disease, which have fallen from 640 in 1897 to 209 during the year under report. An epidemic of conjunctivitis of a mild type occurred amongst the children, and necessitated the closing of the school for some weeks.

Fort Allahabad.—The general health of the troops compares favourably with previous years, though ague was prevalent during the autumn months. The number of admissions for venereal disease showed a further satisfactory decline. No case of enteric fever occurred. The sanitary condition of the fort is satisfactory, but means are required for carrying off the waste water, which, at present, stagnates around the standpipes. During the year water was laid on from the main to the kitchens of the barracks and officers' quarters, and a bath-room provided for the Royal Artillery laboratory.

Benares.—There were 9 cases of enteric fever with 1 death, a slight increase on the preceding year, when there were only 6 cases. Three cases of cholera occurred at the end of May and beginning of June, two of which proved fatal. The disease was widely prevalent after a heavy rainfall in September, but was generally of a mild type. The water supply continues to be obtained from the municipal water works. The quality is good, and the supply ample. The general sanitary condition of the cantonment is satisfactory. The urinals are old and insanitary, but will be replaced in the rebuilding scheme now in progress. The meat supply was reported to be of poor quality.

Dinapore.—The state of the cantonment is considered unsatisfactory, and every effort is being made to improve it. The new British Infantry barracks are almost completed. They are large, airy, and commodious, with every modern improvement. The Artillery lines are not good, the barracks being old, with low plinths. The water supply for drinking and cooking purposes is pumped from a well in the hospital compound, this being considered the best well in cantonments. After being passed through a Pasteur-Chamberland filter, it is stored in iron tanks and distributed by means of pipes. The supply is good and sufficient. Estimates for a new hospital kitchen on a fresh site have been prepared, and the work will shortly be proceeded with. There were only 8 cases of enteric fever with 2 deaths, compared with 15 cases and 3 deaths last year. There was a marked diminution in the number of admissions for venereal disease, the ratio of admissions per 1,000 having fallen from 523·1 in 1899 to 265·5.

This decrease is attributed to the successful working of the cantonment hospital. Cases of plague occurred from March to the end of the year (except during the months of July and August) amongst the native population in the bazars, but there was no case amongst the troops. The disease was prevalent in the neighbouring city of Patna.

NARBUDDA DISTRICT.—*Jubbulpore.* The hospital accommodation is insufficient, but this has been in great part remedied by the addition of a ward, set free for general purposes by the location of the family hospital in a new building, which was erected during the year, and occupied in December. Further extension is also contemplated, as well as the provision of quarters for some of the hospital establishment. The water supply, which is obtained from the municipal water works, is ample in quantity, and has been found bacteriologically pure, but the drinking water is still treated with potassium permanganate before use. The hospital is supplied with very good milk and butter from the Commissariat dairy. These supplies are obtained for the British units from cows milked under European supervision. There were only 9 cases of enteric fever, compared with 26 and 40 respectively in the two preceding years. Six of these cases ended fatally. One case of cholera occurred, the disease, however, having been contracted outside the station. Malarial fevers were more prevalent than in the preceding year, the increase being attributed to the heavy rainfall. The ratio of admissions for venereal disease also showed a slight increase, which was considered due to infection of the men while in camp seven miles from cantonments during the early part of the year, there being a marked increase in the number of admissions during this period.

Saugor.—The defects previously noted in the east wing hospital, which consists of two buildings, have not yet been remedied, but it is hoped the alterations required to improve the lighting and ventilation will be carried out in one of the buildings during the current year. The construction of fire-places in the special ward and family hospital has been recommended. During the year the cookhouses have been provided with wire netting swing doors, and wire netting is also being fitted to the windows. The water supply, which is obtained from wells, is of good quality, but, owing to the drought, was scanty during the hot weather, necessitating the closing of the plunge baths. The drinking water is treated with potassium permanganate. The latrine accommodation in the cantonment is insufficient, and is to be increased. Cholera was very prevalent in the district, and a few cases occurred in cantonments, one officer dying of the disease. Malarial fevers were very prevalent, especially during October and November, some of the cases being of the Peshawar type. Quinine was issued as a prophylactic in September, and again in part of October and November. Scurvy of a very mild type appeared amongst the British troops in August, but disappeared after lime juice had been issued daily for a month. The cantonment hospital was opened in February, and has been worked with success, the ratio of admissions for venereal disease having fallen over 50 per cent. compared with the previous year. There was only one case of enteric fever, the same number as last year.

Pachmarhi.—The accommodation was insufficient, but overcrowding was prevented by the occupation of some of the dining halls as dormitories. A maternity ward is required for the station family hospital, in which, at present, there is only one ward. A ward for sick officers is also required. The water supply, which is obtained from wells, is good, and was abundant throughout the year in spite of the drought. Two of the wells were fitted with pumps during the year. Water cisterns were placed outside the lavatories to supply the bath-rooms, and wire doors were provided for the kitchens. The general health of the troops was very satisfactory. Malarial fevers were not prevalent, although the rainfall was very heavy. The number of admissions for venereal disease showed a diminution, but the medical officer in charge is of opinion that some of the men concealed their disease. A cantonment hospital has been sanctioned, but not yet opened. The station was entirely free from enteric fever.

Ind . BUNDELKHAND DISTRICT.—*Agra.* There was a considerable diminution in the number of cases of enteric fever, the admissions and deaths being 19 and 5 as compared with 33 and 10 in the previous year. The cause of the disease was not definitely determined. The disease prevailed in April and May, and again in September and November. Ague was slightly more prevalent than in the preceding year, owing probably to the heavy monsoon. The anopheles mosquito was found in the hospital compound, and also in several pools in barracks. There was an increase in the number of admissions for venereal disease, although the rules embodied in the cantonment code were carefully carried out. Water for drinking and cooking purposes was obtained, as in the preceding year, for the whole garrison from two wells situated in the British Infantry lines. It is raised from the wells by force-pumps, and boiled before use. Municipal pipe water was used in the fort for ablutionary purposes only. The water from the two wells was examined weekly, but no microbe resembling that of enteric was discovered in it. The milk and butter, supplied by the Government dairy, have, as a rule, been good, though, on one or two occasions, the percentage of cream in the milk was small. Some of the cookhouses have been fitted with wire gauze over the windows, and self-closing doors covered with the same material, and the remainder will be completed soon. Arrangements are being made to remove the biltong factories, which are a nuisance, to the left bank of the Jumna. A cantonment piggery is required, and this, it is said, can be started when the Government dairy has expanded more. It will then be under the same management. The cantonment slaughter-house is badly drained, and there is no water laid on for cleansing and flushing purposes. These defects are now being attended to.

Jhansi.—The barracks have been undergoing reconstruction during the ast three years, and considerable progress was made in the work during the year under review. Sanction has been received to increase the accommodation of the station hospital, which has hitherto been insufficient, and estimates for the extension have been submitted. An officers' ward is also greatly needed. The accommodation for the men of the Army Hospital Corps is insufficient. The drinking water is obtained from wells, for one of which a pump has recently been provided. The water is of good quality but very hard. It is boiled and "pinked" before use. The introduction of movable latrines in the compounds of private bungalows is shortly to be commenced, and the work will, it is hoped, be carried out during the current year. The surface drains of the sadr bazar are defective, and will be improved as funds become available. Enteric fever caused only 17 admissions and 3 deaths, compared with 33 and 7 last year. There were also 2 cases amongst the officers. The cause of the disease could not be traced. Ague was very prevalent, probably owing to the heavy rainfall, and quinine was issued as a prophylatic to the British troops.

Nowgong.—The general health of the garrison was better than in any of the preceding ten years, the admission ratios for malarial fevers and venereal diseases both showing a decrease. Enteric fever increased slightly, the number of admissions and deaths being 8 and 5 respectively, as compared with 5 and 2 in the previous year. No definite cause could be traced in any of the cases, and there is said "to have been nothing in the sequence of their occurrence to arouse suspicion of their connection with any common condition." All the admissions were from the detachment of the North Staffordshire Regiment, and none from the field battery. There were eleven admissions for heat-stroke, one of which proved fatal. The water supply from wells is of good quality, and sufficient in quantity. Repairs to the coverings of the wells to minimize the risk of surface pollution were carried out during the year. The surface drainage of the sadr bazar is defective, but improvements are now being made. The beef supplied during the year was of poor quality, owing to the bad condition of the cattle in consequence of the scarcity of fodder, but efforts are now being made to improve it. A new trenching ground, at a greater distance from cantonments, and also more accessible than the old one, was taken into use in June.

ROHILKHAND !DISTRICT.—*Bareilly.* The general sanitary condition of the station is very satisfactory. A large amount of latrine plant has been

provided during the year, but more is still required, and will be supplied as funds permit. The provision of public latrines and butchers' shops is under consideration; it is found very difficult to keep the present ones in a proper sanitary state. The sanitation of the villages in the vicinity of cantonments has been made over by the civil authorities to the cantonment magistrate, and it is hoped that in time considerable improvement will be effected in them. The drinking water for the troops is obtained from three wells, two of which have been provided with pumps. The well which supplies drinking water for the hospital has also been similarly provided. Work on the piped water is progressing. Zinc-covered tables and wire gauze doors have been fitted to all the cookhouses, and towards the end of the year Congo stoves were taken into use, the men doing their own cooking. At the beginning of the year during the cold weather, consequent upon the concentration of troops from the hills, tents had to be pitched as usual, to increase the hospital accommodation. The health of the garrison was satisfactory. There were only 6 cases of enteric fever with 1 death, compared with 20 cases and 4 deaths in the previous year. Ague was prevalent during and after the rains, but was not of a severe type. Cholera was prevalent in the neighbourhood from July to November, but only 11 cases occurred in cantonments, 9 being in the sadr bazar, and 2 in the native cavalry lines. All wells in the bazars are treated weekly with potassium permanganate, and it is considered that this measure may possibly have checked the spread of the disease.

Naini Tal.—The year was a healthy one, and there was no prevailing disease amongst the men at the depôt. There were no admissions for enteric fever, the number last year being 3. The general sanitary condition of the depôt is very satisfactory, and no defects were noticed. Municipal water, which is of excellent quality, is laid on to the depôt. The drinking water is boiled and "pinked" before use.

Ranikhet.—The health of the garrison was exceptionally good. This was considered to be due to the absence of young soldiers and of convalescents from the plains, the accommodation usually reserved for the latter being this year taken up by married families. There were only 12 admissions for enteric fever with 2 deaths, this being about half the annual average number of admissions for the past ten years. The ratio of admissions for venereal diseases was also much smaller than in previous years. The general sanitary condition of the station is very satisfactory, and no defects were noticed. The water supply, which is obtained from the Chippra and Mint springs, is of good quality, and the quantity sufficient. It is free from contamination at its source, the reservoirs at these springs being carefully protected. Metal *pakhals* were used as far as possible for the distribution of the drinking water, which is boiled before use. The pipe water supply has been taken in hand.

Chaubuttia.—The reconstruction of the barracks, which were originally built of wood, has been almost completed, only one barrack remaining out of 18. This will be taken in hand during the cold weather when the station is empty. The water obtained from the forest spring is of excellent quality, and the supply sufficient. The drinking water is boiled and treated with potassium permanganate. Wire gauze was fitted to the doors and windows of all the cookhouses during the year, and is said to have proved most effective in excluding flies. An incinerator has been sanctioned, and is to be built close to the present site of the filth pits. Its construction has already been taken in hand. The number of admissions for primary venereal disease was small, and enteric fever furnished only 2 cases, as compared with 4 last year.

Shahjahanpur.—This station was only occupied for the first two months of the year by a detachment of about 60 men, and calls for no remarks.

MEERUT DISTRICT.—*Meerut.* There were only 17 admissions for enteric fever with 10 deaths, against 45 cases and 17 deaths last year. There was a slight increase in the number of admissions for ague, due chiefly to the number of cases amongst the men of the 2nd Connaught Rangers, who had been stationed at Delhi. Quinine was issued as a prophylactic to companies returning from Delhi, with beneficial results. 3 cases of cholera occurred,

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all of which proved fatal. The ratio of admissions for venereal diseases
all forms shows a marked decrease, compared with previous years. Th
general sanitary condition of the station is satisfactory, except as regar
the situation of the cattle lines of the British Cavalry Regimental Dair
which is too close to the barracks. Steps are being taken to remedy thi
The bazars and officers' lines also are said to be overcrowded. At presen
however, the cost of the remedial measures proposed is prohibitive, thoug
it is hoped that, in the future, it may be possible to effect some improv
ments. The water supply is from the municipal water works, the wat
being laid on to barracks, and drawn direct from taps. It is of very go
quality, and is not boiled before use. During the year swing wire gau
doors were provided for the cookhouses, and several other minor improv
ments also carried out.

Roorkee.—The re-roofing of the Royal Artillery barracks, which we
originally thatched, is gradually being carried out, and half the numb
have already been completed. The floorings of broken brick are also bei
replaced by stone flags. All the old lavatories are to be pulled down a
replaced by new ones, and during the year two, of excellent design, we
constructed. Waste water from the lavatories is disposed of partly b
absorption pits, and partly employed for irrigating small gardens in th
vicinity of the lavatories. The latter method is found satisfactory, and
to be shortly adopted for all the lavatories. Wire gauze swing doors ha
been recently fitted to the cookhouses. Drinking water is obtained from
covered well situated near the centre of the barracks. The well is provide
with a pump, which, however, is placed immediately over it, and a co
siderable quantity of water finds its way back into the well through th
cover. The drinking water is boiled and "pinked" before use. The Roy
Engineer lines are supplied with water from an open well near the wor
shops. The water contains a large excess of chloride, as compared with th
obtained from the Royal Artillery well. This the medical officer in char
ascribes to contamination of the subsoil water in its passage from west
east beneath the lines and bazar of the Bengal Sappers and Miners. Th
water is boiled before use. No case of enteric fever occurred amongst th
troops stationed in the cantonment. Ague was prevalent during the latt
half of the year, but the disease was of a mild type. There was a very gre
diminution in the prevalence of venereal disease, the admission ratio p
1,000 being only 210·4, as compared with 362·7 in the previous year, a
an average ratio of 423·5 for the five years ending 1899.

Muttra.—This station was only occupied by the depôt of the 9th Lance
the regiment being in South Africa. The average strength of the garris
was 77 men. One case of enteric fever, which proved fatal, occurred duri
the year. The drinking water is obtained from covered wells, being fi
treated with potassium permanganate, and afterwards boiled in Larymo
boilers. The general sanitary condition of the station is satisfactory, a
no defects were noticed.

Delhi.—The year was an unhealthy one, the number of admissions f
ague being very high (1,680 per 1,000). This disease was of a severe ty
over 60 cases having to be sent to the hills and elsewhere for change of a
Quinine was issued as a prophylactic twice weekly to all the garrison fr
August to November. The rainfall was very heavy, and the anophel
mosquito extremely numerous. Attempts were made to lessen the numb
of the latter by draining puddles, and by the use of kerosene oil, &c., b
without apparent success. There were 9 cases of enteric fever, as compar
with 11 in the previous year. There were also 6 cases of cholera, all
which proved fatal. The ratio of admissions for venereal disease showe
considerable decrease. The water supplied by the municipal water works
of good quality, and is used without filtering or boiling. Estimates ha
been prepared for laying it on direct to the barracks. New movable ir
urinals are required in the native infantry lines, and will be provided wh
funds are available for the purpose.

Landour.—There was only one admission for enteric fever, as compar
with three last year. The disease was considered to have been co
tracted before arrival in the station. A case occurred in an officer, w
also had contracted the disease in the plains. The question of t

demolition of certain native houses, situated in the middle of the barracks, and which are considered insanitary, is still under the consideration of Government. During the year two new barracks, one for single and the other for married men, were built. The water is at present conveyed in leathern *pakhals* from the covered iron tanks, where it is collected, but metal *pakhals* have been asked for, and will, it is expected, be available by next season. The erection of an incinerator has lately been sanctioned.

Chakrata and Kailana.—The year generally was a most healthy one, the mortality being the lowest on record. There were only 13 cases of enteric fever with no deaths, as compared with 74 cases and 10 deaths last year. 8 of these cases were contracted either at other stations or on the line of march. The remaining five cases all occurred at Chakrata, Kailana this year being quite free from the disease. The admission ratio per 1,000 for venereal diseases was 213 against 270 last year. In 1897 the admission ratio was 952, since which year there has been a continuous and marked decrease. The water supply is obtained from four springs situated in the Deoban range of hills about five miles from cantonments, being conducted in iron pipes to distribution tanks at Chakrata, whence it is distributed in *pakhals* to Chakrata and Kailana. Three of the springs are well protected at the intake, but the use of the fourth spring was discontinued in June owing to the *bacillus coli* having been discovered in it. The pipe line requires carrying higher up, and an estimate for this extension is being prepared. A project for the extension of the pipe line to Kailana, a distance of about two miles, is now under revision. All the drinking water is boiled before use. The barrack accommodation is insufficient, partly owing to the occupation of one block as a hospital ward, and was supplemented by the use of tents until the beginning of the rains. An approximate estimate for increasing the hospital accommodation has been sanctioned, and the work will, it is hoped, be commenced in 1902. The new hospital at Kailana has been completed, and is now ready for occupation. New urinals were erected at Kailana during the year, but more are still required at Chakrata. A Garlick pattern incinerator is in course of construction at Chakrata.

Punjab Command.

The Officiating Principal Medical Officer, Colonel C. H. Joubert, M.B. Indian Medical Service, reports as follows :—

Sirhind District.—*Umballa.* General sanitary condition of cantonments was good. General health was good, with the exception of a severe outbreak of malarial fevers, which occurred during September, October and November, and was caused by heavy rainfall, which reduced the surrounding country to the condition of a marsh. The disease was generally of a severe type, accompanied in several cases by bilious vomit, hæmorrhage and collapse. Enteric fever was less prevalent, the admissions during 1900 being 21, as compared with 57 in the previous year; the ratios per 1,000 being 14·3 and 32·0 respectively. The smaller number of cases occurring in this year is ascribed to its probably true cause, *i.e.*, a less susceptible community owing to absence of young soldiers. The water supply is deficient in quantity and liable to contamination, and the provision of new piped supply is proposed. A trial well has been sunk, to ascertain if sufficient water is likely to be obtained, and if satisfactory a detailed project for a new and increased piped water supply will be worked out. Venereal diseases were less prevalent than in the previous year. The provisions of the Cantonment Act have been extended to the city and surrounding villages. The Government dairy continues to give satisfactory supplies. New cookhouses with automatically closing doors and windows (wire gauze) are now in use. Cooking was done by the troops,

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Kasauli.—General sanitary condition fairly satisfactory. In connection with the water supply, an order has recently been issued that metal vessels are to be used instead of *pakhals* for distribution. A scheme for pumping water to the top of the hill and distributing by pipes is also under consideration. Conservancy is by incineration and is satisfactory. Enteric fever and venereal diseases both show decrease in admission rate compared with last year. Inoculation with Wright's vaccine was performed in 101 cases. The chief sanitary defect was the milk and butter supply, which it is proposed to remedy this year. The Pasteur Institute of India was opened in August by the Director, Major D. Semple, Royal Army Medical Corps.

Subathu.—General sanitary condition satisfactory. Enteric fever decreased compared with previous year, and is ascribed to the introduction of a good water supply. Venereal disease increased, due (1) to condition of men coming from Burmah, (2) impossibility of enforcing Cantonment Code as no hospital exists. The question of establishing a cantonment hospital at this station is under consideration. Malarial fevers were prevalent owing to unusually heavy rainfall and the growth of rank vegetation around the cantonments.

Dagshai.—General sanitary condition and health of troops most satisfactory. There were 6 cases of enteric fever, as against 19 in 1899. One case in military prison, traced to drinking water from a dirty *surahi* from the bazar. Venereal diseases were less in number than in 1899. There is no cantonment general hospital, but the question of establishing one is under consideration. A few cases of small-pox occurred, but the disease was promptly checked by suitable measures of isolation, &c. Milk and butter supply unsatisfactory, but steps are being taken to establish a branch of the Government dairy in the station. A third incinerator is being built.

Jutogh.—General sanitary condition good. Enteric fever caused 5 admissions; all were imported cases. A new piped water supply is under consideration, it being contemplated to obtain a supply from the Simla water works.

Solon.—General sanitary condition satisfactory. Only one case of enteric fever occurred and was attributed to the man having drunk water down the *khud*. The collecting area in connection with the water supply is at present liable to pollution and requires to be fenced in.

LAHORE DISTRICT.—*Mian Mir.* During the year 1900, Mian Mir maintained its reputation as an unhealthy station. The number of admissions was higher than in 1899 on a somewhat smaller strength. This increased sickness was chiefly caused by severe incidence of malarial fevers, which was general throughout the Punjab and is ascribed to an unusually heavy rainfall. There were fourteen cases of cholera among the European troops. The mortality was heavy. In no case was the cause of the disease traced to a particular source, but the disease was prevalent among the civil population of the surrounding district. Enteric fever was less prevalent than in 1899; the number of admissions being 16, as compared with 19 in the previous year. The water supply of this station is from the Bari Doab Canal, and is at its source liable to daily and hourly pollution. It is subjected to sand filtration, but in a most imperfect manner, which affords no protection from danger. The water is subsequently boiled and "pinked." There is at present under consideration a scheme to supply Mian Mir with a piped water supply from Lahore.

Fort Lahore.—An outbreak of cholera occurred in the men of the Bedfordshire Regiment between September 10th and 13th. Seven cases with six deaths. The disease was imported from the city, and no more cases occurred after moving the men into tents. Malarial fevers were very prevalent as elsewhere. The general sanitary conditions are satisfactory.

Ferozepore.—The most notable incident connected with the station in 1900 was an extremely severe outbreak of malarial fever, which attacked the whole population, both civil and military. So severe was this epidemic that the whole garrison was practically rendered ineffective. The number of admissions for malarial fever on practically the same strength was, in

1900, 1,331, against 464 in 1899. The type during the later stages of the epidemic was of the malignant æstivo-autumnal character, accompanied by coma, collapse and high temperature and sometimes hæmorrhage. The incubation period was observed to be about fourteen days. Quinine in these cases seemed to do little good. The cause of the epidemic was the floods due to unusually heavy rains during the month of August. Mosquitoes were abundant, and anopheles were found in the hospitals and barracks in great numbers. There were 7 cases of enteric fever as compared with 23 in 1899. The cause was not traced in any case. There were 7 cases of cholera among the 38th Dogras in July. General sanitary condition of the station is satisfactory. The water supply is good and abundant; but its distribution is by vessels and is not piped. The project for a piped water supply is under consideration.

Jullundur.—The general health of the station and its sanitary condition have been satisfactory during 1900. Enteric fever only gave three cases (5 per 1,000), as compared with 16 (25 per 1,000), in 1899. The medical officer assigns as the cause of this improvement (*a*) the large number of young soldiers who are sent to the hills for the hot weather, (*b*) the care taken in boiling and "pinking" the drinking water. Malarial fevers were more prevalent than in the previous year, the increase being due to excessive rainfall and to the presence in the station of a wing of the Royal Inniskilling Fusiliers, who were saturated with malaria at Mian Mir. The only insanitary condition brought to notice is the extension of grass farm lands in cantonments and the free manuring which takes place in consequence. If the mosquito malaria theory is a correct one, this condition will, no doubt, lead to an increase in cases of malarial fevers. There were 40 cases of inoculation with Wright's anti-typhoid vaccine during the year; there were no attacks among the inoculated.

Multan.—The general sanitation of the station was satisfactory. The general health of the troops was not so good as in the previous year. This is accounted for by the return of a wing of the Bedford Regiment from Mian Mir, where it became saturated with malaria. Enteric fever was slightly more prevalent, but of a milder type than in 1899. No definite cause was discovered. No cases of enteric fever occurred among men who had been inoculated with Wright's vaccine. Venereal diseases were more prevalent than in 1899.

Amritsar.—The general health of the station was better than in 1899. There was one case of enteric fever during the year. Malarial fevers were more prevalent than in 1899, but no epidemic occurred. The sanitary conditions are generally satisfactory, but the medical officer remarks with reference to the water supply, which is from open wells, that though generally good, it is, from the fact that wells are open, liable to pollution.

Dalhousie.—The general sanitary condition of the station is satisfactory. The principal sanitary defect is the absence of proper washing *ghâts*. There were 15 admissions for enteric fever with 3 deaths as compared with 27 admissions and 5 deaths in 1899. Thirteen were admitted shortly after arrival and were probably not contracted in the station. No cases occurred amongst inoculated men.

Rawal Pindi District.—*Rawal Pindi.* The general sanitary condition of the station is satisfactory. The water supply is good, but in the hot weather months is not over-abundant. To remedy this another well has been sunk at Rawal and a dam is being built across the river about a quarter of a mile from the wells, with the object of raising the general water level at the wells. The cantonment bazars are much overcrowded. Conservancy is carried out on the Allahabad system, and steps have been taken to facilitate the strict observance of its details. The general health of the station was good. Enteric fever caused 59 admissions with 12 deaths against 99 cases and 19 deaths in 1899. Several smaller sanitary improvements have been carried out during the year, *e.g.*, more houses for *dhobies*, with suitable stores for clothes, have been provided. Some improvement in the drainage of the west ridge has been carried out.

Sialkot.—The general health of this station was very satisfactory. The improvement is greater than can be accounted for by the reduction of the

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strength by 370, owing to the absence of the cavalry regiment in South Africa. Enteric fever showed no admission, compared with 15 cases in 1899. In this connection it may be noted that the drinking water wells have been covered in and pumps attached. A cantonment general hospital was opened in July, 1900.

Campbellpore.—Sanitary condition of station was satisfactory, and the health of troops was fair. No sanitary improvements of any importance were undertaken during the year. Enteric fever gave three admissions, the same as in 1899. No unusual sickness of any kind prevailed. Venereal disease shows a slight increase. There is no cantonment general hospital in this station, but one is to be provided shortly.

Attock.—The general sanitary condition of the station was satisfactory, and the health of the troops has been fair. There were two cases of enteric fever the same as last year. No cause was discovered. Venereal diseases gave 44 admissions, an increase compared with 1899. There is no cantonment general hospital in this station. The station hospital has been re-roofed during the year.

Murree.—The health of the troops, and the general sanitary condition of the station, was satisfactory. Only one case of enteric fever was admitted to the hospital, which is stated to have been contracted in Rawal Pindi; it is further noted with regard to this case that the man had been inoculated with anti-typhoid vaccine in March of the same year, being at acked in June, and the disease was very mild. Very few cases of venereal disease occurred in the station.

Ghurial.—The general sanitary condition of the station was satisfactory. Surface drainage has been improved, and there is room for further improvement in this respect. The general health of the garrison was satisfactory. Enteric fever was more prevalent than in the previous year, causing 12 admissions against 3 in 1899. In no case was the cause of the disease traced. Four cases occurred among men who had been recently inoculated, with one death.

Upper Topa.—This is practically a camp. The only stone building is the hospital. The health of the troops showed a marked improvement compared with 1899. Enteric fever caused 4 admissions, compared with 8 in 1899. Venereal caused 45 per cent. of all admissions, and the medical officer points out that the disease was mostly contracted in Murree or Gharial bazars, both of which had been placed out of bounds. The general sanitation was satisfactory.

Lower Topa.—This is another camp in which the troops are under canvas, and only a few permanent buildings exist. The health of the troops was good and the sanitary condition satisfactory. One case of enteric fever occurred, which was imported. The building used as a hospital is from a structural point of view, and from its position, entirely unsuited for that purpose. 45 per cent. of the admissions to hospital were caused by venereal diseases.

Kuldana.—General sanitary conditions of the station were good. Since last year increased barrack accommodation has been provided. The native cooks, as in the other hill stations, have been dispensed with, and soldier cooks employed. The medical officer points out the necessity for the provision of European cooking ranges to render this arrangement completely satisfactory. Enteric fever caused 1 admission, an imported case, against 11 admissions in 1899. The water supply, as in the case of above mentioned hill stations, is a piped supply from the Murree water supply. Venereal disease caused 103 admissions, nearly 50 per cent. of the total admissions, contracted chiefly in Murree bazar, and when this was put out of bounds, on the *khud* sides.

Thobba.—This is a standing camp, all the troops, with the exception of the Royal Garrison Artillery, being accommodated in E.P. tents. The latter are housed in permanent huts. The water supply is from Murree. The general health of the troops was good. Enteric fever gave 7 admissions against 8 in 1899. These all occurred among the men of the Bedford Regiment with the exception of one case. They were all imported cases, and the medical officer thinks were contracted at Mian Mir rest camp, the water of which is defective. Venereal disease caused 120 admissions out of a total of 396 for all diseases. The protection of this station from venereal and other infectious

and contagious diseases is being considered in connection with a general scheme for the protection of all hill stations in the Murree Hills. The general sanitation of the camp was satisfactory.

Khyra Gali.—The sanitary condition of this station is reported as satisfactory. New stone cookhouses were built this year. No cases of enteric fever occurred this year, as against two the year before. There was but little venereal, as the majority of admissions were old cases. In this connection it may be pointed out that the garrison consisted of No. 2 Mountain Battery, Royal Garrison Artillery, the men of which are picked soldiers who know how to take care of themselves. Two cases of enteric fever occurred among native followers, one of which was caused by nursing the other.

Changla Gali.—A school of musketry is established here. The health of troops has been excellent. No insanitary condition.

Ghora Dhaka.—Health of troops has been good, and the sanitary condition of the station is generally satisfactory. Estimates for the provision of new *dhobies'* tanks are being prepared.

Kalabagh.—The health of troops has been good, and the sanitation of the station satisfactory. Venereal disease accounts for most of the inefficiency, and is being dealt with in a general scheme for the protection of all the hill stations in the Murree Hills.

Bara Gali.—Health of troops compares favourably with 1899, constantly sick being only 1·79, against 3·95 in 1899. There were no admissions for enteric fever, against 1 in 1899. No cases of venereal disease occurred in the station. The general sanitary condition of the station is satisfactory. Water supply good, but water was being distributed in *pakhals*. The subsidiary buildings for the hospital are insufficient. This is being gradually improved.

Khan Spur.—This is a standing camp a little over one mile from Ghora Dhaka. The sanitary condition of the camp is reported as very good, and no sanitary defects have been brought to notice. The health of the troops was good. There were 3 cases of enteric fever against *nil* in 1899. These cases are all reported as having originated before coming to Khan Spur. Estimates for the provision of new *dhobies'* tanks are being prepared.

Peshawar District.—*Peshawar.* General sanitary condition satisfactory on the whole. Water supply good and sufficient. Distribution is from filtering beds by pipes, and is laid on to barracks and cookhouses. Pasteur filters have been installed for all the British troops in cantonments. Good milk and butter are supplied by Regimental dairies. Suitable tanks for washing clothes, completed for British Infantry and hospital. Disposal of sewage is by Allahabad system and was reported as unsatisfactory during wet weather. Enteric fever was less prevalent than in the previous three years, *i.e.* :—

Year.	Admissions.	Ratio per 1,000.	Deaths.	Ratio per 1,000.
1897	87	44·2	53	26·93
1898	102	52 0	48	24·48
1899	42	25·3	16	9·87
1900	20	19·5	15	10·06

One case of cholera occurred among British troops, while the disease was prevalent amongst the civil population of Peshawar valley. Malarial fevers were more prevalent than in previous year, probably due to unusually heavy rainfall. The admissions for venereal diseases were practically the same as in previous year, 303 as compared with 302. The cantonment general hospital was opened in July, 1899.

Noushera.—The water supply is from protected wells. It is good and abundant, and is "pinked" with permanganate of potash. A piped water

lia. supply is still under consideration. Milk and butter, supplied by regimental dairies, was of good quality. The conservancy is on the Allahabad system, without cultivation of trenches, which is described as impracticable. The surface drainage, owing to conformation of ground, is unsatisfactory. Enteric fever was more prevalent than in the previous year, *i.e.* :—

Year.	Admissions.	Ratio per 1,000.	Deaths.	Ratio per 1,000.
1899	4	5·4	2	2·72
1900	16	21·2	5	6·62

Malarial fevers were more prevalent than in previous year, and were ascribed to floods at the end of August and beginning of September. There was a slight increase in the admissions for venereal diseases. Cantonment general hospital was opened in October, 1899.

Cherat.—The works connected with the new water supply of this station will probably be commenced in 1901. Smaller number of troops than usual was sent up to Cherat this year, and the general health of the station was much better than in previous years. Enteric fever gave 5 admissions, of which 4 were imported cases. Malarial fevers and venereal diseases were less prevalent.

Madras Command.

The Principal Medical Officer, Surgeon-General G. W. R. Hay, M.D., Indian Medical Service, reports as follows :—

Bangalore District.—*Bangalore.* An increase in the number of admissions for malarial fevers took place during the year, especially amongst the infantry, during May, June, and July, coinciding with the latter part of the hot weather and early rains, and probably due to the development of the malaria-bearing mosquito during these months. 123 cases occurred during the year, giving a ratio of 179·0 as compared with 83 admissions during 1899, ratio 51·4 per 1,000. There were remarkably few cases of enteric fever, only 5 (none since September), *i.e.*, 7·3 per 1,000 instead of 59 in 1899, or 13·6 per 1,000. This decrease may be partly due to sanitary improvements and partly to the small number of young soldiers from England during the year. Though plague was epidemic amongst the native population, only 2 cases occurred amongst the British troops. There were, however, 61 cases amongst the followers of British troops. The removal of nightsoil from barracks is efficient, but its disposal appears to require attention. The soil is stored during the greater part of the year in the shallow pits on Agram Plain and afterwards removed by cultivators to their fields. In the Annual Sanitary Report of the station of Bangalore for 1900, one of the suggestions made is that "an effort should be made to introduce the trench system of disposal of nightsoil with the subsequent cultivation of the area made use of." The necessity for covering the open sewer which existed near the Government dairy was brought to the notice of the District General Officer Commanding, who states "the drain referred to was a municipal one. On my representation, it is being moved and work has already begun." The necessity for a thorough sanitary control being established over the Chamrajendra Reservoir (the main water supply of Bangalore) being represented, Major A. M. Davies, R.A.M.C., was deputed to examine and report on this reservoir and its surroundings, and to advise what steps were necessary to preserve it from pollution. This he did in March, 1900, and made certain recommendations regarding the acquisition and cultivation

of land, and the removal of villages around the reservoir, which, if carried out, would result in the reservoir being surrounded by a belt of clean grass land for a space of 50 yards from its margin, in no cultivation for about a mile round, and no villages draining directly into the lake. He also recommended that a trial be made of the Jewell system of filtration, since the present filtration works fail to furnish a properly filtered supply during the rainy season. Should the Mysore Government be able to carry out these recommendations, the Bangalore water supply should be one of the best in the Command. In the meantime, the water is being examined frequently, both chemically and bacteriologically. With regard to soldier (British) cooks, attention is drawn to the fact that, if soldier cooks are to be employed, some alteration in the present standard plan of cook-houses must be made and ranges put up. As at present constructed, they would injuriously affect the health of Europeans. It is understood, however, that the general question has been referred to the proper authorities.

Southern District.—*Calicut.* The general health of the troops has been "fair." The percentage of venereal cases to total admissions during the year was much the same as in 1899, being 36·8 as compared with 38·8. Simple continued fevers have been slightly on the increase, being 22·06 per cent. of total admissions as against 18·4 in 1899 and 3·1 in 1898. There were four deaths amongst British troops during the year, two of which were from enteric fever and the other two from abscess of liver. No epidemic has occurred. The cantonment is situated about three-quarters of a mile from the sea coast, at an elevation of 120 feet; the situation is one of the healthiest in the district. There are no bazars within cantonment; the sanitary supervision is vested in the municipality and is well regulated. The remodelling of married quarters has been completed, and these quarters are now satisfactory. Several minor sanitary works, such as construction and extension of drains, have been carried out, but the hand-pump sanctioned for the drinking-water well has not yet been put up, though the machinery has been ready for some time. Until this is completed the drinking water cannot be said to be properly protected from pollution. The provision of small cooking-places for men of the Army Hospital Corps, previously recommended, has not been carried out, being unauthorized These are desirable at all station hospitals, but specially at a place like Calicut, where the rainfall is heavy. A boiler for disinfecting hospital bedding and clothing still remains to be built, and the tank, mentioned in previous reports, is as yet not filled in.

Cannanore.—There has been no unusual amount of sickness amongst the European troops this year as compared with previous years. The ratio of admissions per 1,000 has been 784·9, whereas in 1899 it was 812·5. The improvement in health is mainly due to the smaller number of admissions for venereal disease. No deaths occurred among the British troops during the year. Sanitation is satisfactory. The land set apart for trenches in which to bury the deposit from latrines on the removal system has been placed under cultivation. An incinerator has been used during the last six months of the year and about one-eighth of the refuse and excreta burnt in it, the remainder being buried. A larger incinerator is under construction. A representation has been made to the Sanitary Commissioner, Madras, regarding the desirability of prohibiting wet cultivation on the land in the immediate vicinity of dwelling-houses in cantonment; the matter is under consideration. An estimate has been prepared for roofing in and fitting a pump to the well used for drinking water.

Malapuram.—There has been a marked decrease in the number of admissions for venereal disease during the year; thus during 1899 there were 53 admissions for venereal to the station hospital, whereas during 1900 there were only 25, the strength remaining the same. This may be attributed to some extent to the use of the special washing compartment, provided with sulphate of zinc solution, lamps, towels, &c., sanctioned for a year's trial at Malapuram, but is also due to the enforcement of the rules of the Cantonment Code of 1899 relating to the prevention of the spread of contagious and infectious diseases. The majority of the recommendations

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made in last year's report have not been carried out. For instance, the roofs of the married quarters have not been provided with ceilings to mitigate the radiation of heat. No latrines have as yet been provided for the native servants employed in barracks, nor for officers' servants, and, as a consequence, the immediate neighbourhood must be fouled. It is suggested that three latrines on the removal system be constructed, one for the commissariat transport lines, one for natives employed in barracks, and one for officers' servants. The General Officer Commanding states that the matter will be attended to. A boiler for disinfecting purposes has been erected at the station hospital. The District Principal Medical Officer has suggested to the General Officer Commanding that "in a station like this, where the men have little to do, some special means for affording them gymnastic exercise would be good for their health and physical fitness."

Wellington.—It is satisfactory to note that only 4 cases of enteric fever occurred amongst the British troops at Wellington against 16 last year. Malarial fevers, however, have been very prevalent, especially amongst the the natives living in villages around; there have also been a number of cases of beri-beri amongst natives. With a view to reducing malarial fevers at Wellington, the District Principal Medical Officer has recommended that a small valley above the lake should be cleared and drained, and the lake emptied, thus forming a useful recreation ground. He adds:—"The lake answers no useful purpose, but it keeps the ground above and below it damp and probably favours the propagation of malarial mosquitoes, which might probably account for the unusual prevalence of malarial fevers during the year." This recommendation that the valley above the lake should be cleared and drained is being carried out, levels for the purpose have been taken, and the work commenced. The Senior Medical Officer's attention has been drawn to the advisability of having the vicinity of barracks searched for the malaria-bearing mosquito or larvæ, and of taking measures to destroy the breeding-grounds. The sloping ground, covered with brush-wood, behind the depôt rooms, which was reported to be in an insanitary condition owing to water from the cookhouse flowing over it, has been cleared and is now sanitary. There are not sufficient conservancy carts allowed for the depôt barracks at Wellington. On this point the medical officer in charge, station hospital, Wellington, writes:—"During the summer, there was great difficulty in getting urinals emptied during the night on account of insufficient supply of filth carts. This is especially the case with the depôt; when it is fully occupied, there are not enough filth carts to take the nightsoil and urine to the trenches. It was the practice till quite recently to empty all the urine and dirty water from the cookhouses on a field close to the barracks. The smell from this portion of ground was so bad that I recommended on sanitary grounds that all the urine should be taken up to the side of the hill where the filth carts are emptied. The carts ought to be increased in number to allow of this being done." The District General Officer Commanding states that "an increase of conservancy establishment is being considered." In last year's report, attention was drawn to the unsatisfactory water supply (dual system) at Wellington. During the year under report, Major A. M. Davies, R.A.M.C., has examined the three sources of supply, and has come to the conclusion that all three must be considered "unsatisfactory," being liable to contamination in each case from pollution of the surface and subsoil. He suggests that either (1) the channel supply should be introduced in pipes throughout the whole distance, the collecting area of which being cleared, &c., or (2) that deep springs be sought for within cantonment at a level above all habitation. As a preliminary scheme for a joint supply for the civil station of Coonoor (three miles distant) and Wellington is being worked out by the Public Works Department, no further action in the matter is required at present.

SECUNDERABAD DISTRICT.—*Secunderabad.* The year under report has been an unhealthy one; cholera has been epidemic and enteric fever more prevalent than last year. The latter disease gave rise to 77 admissions (an increase of 29 on last year) resulting in 25 deaths. 48 of the cases had been over two years in India. There were 3 admissions for small-pox, all mild cases, 102 cases of simple continued fever were admitted, some of

which were of a severe type and difficult to distinguish from mild cases of enteric fever. The circumstances connected with each case of enteric were closely investigated at the time, but in no case could the cause be traced. The disease was not confined to any particular barrack; in Secunderabad, it is most prevalent during and after the rains. Cholera prevailed as soon as the monsoon began, and, in spite of all precautions, all corps in the garrison, with the exception of the Royal Artillery, were attacked. The disease was of a virulent type; of the 24 cases admitted 20 died. Considering the above, the importance of a pure water supply for Secunderabad is evident, but it is far from satisfactory. That for drinking and cooking purposes for British troops is obtained from three wells which are properly protected, free from contamination and yield excellent water. But that for washing is from a different source, the Gun Rock Reservoir, fed from the Jeddimutla Tank, which tank Major A. M. Davies reported in August, 1900, to be "an impossible supply; the bed of the tank is so foul that the water that comes in contact with it will inevitably undergo risk of pollution, as far as I can judge, for perhaps years to come; contamination was being continued in April last from cattle dung, and from natives washing and bathing in the tank; the objections to the catchment area continue to hold good." Owing to the want of proper rain last year, the quality of the water was very much worse than usual, and muddy and stinking at times. The General Officer Commanding, Secunderabad, strongly recommended that the whole of the Jeddimutla water should be filtered before being passed into mains so that the whole of the garrison would be supplied with filtered water, and this proposal was made to Army head-quarters. Seeing, however, that even after efficient filtration the Jeddimutla Tank water cannot be more than a fair supply, and that, as the Principal Medical Officer, His Majesty's Forces in India, wrote, "unless the tank is thoroughly cleaned out and the whole of the catchment area protected efficiently from pollution afterwards, the supply is never likely to be a good or even a fair one," the Commander-in-Chief in India was opposed to this water being used for British troops and was "of opinion that, until such time as this tank and its surroundings are placed in a thoroughly sanitary condition, the present arrangement for the supply of *drinking* water to British troops should continue." Later the Commander-in-Chief decided that, owing to it being extremely objectionable to have one water for drinking and another for washing purposes, "the use of the Jeddimutla Tank water in *any* way by British troops is to be deprecated." The use of this water, however, for washing purposes is, it is understood, unavoidable until a further supply can be obtained from elsewhere; this the District General Officer Commanding has been requested to report on. The system of drinking water distribution is not at all satisfactory. The wooden carts employed are objectionable, however much care is taken in keeping them sweet and clean. The plan of fixing the bamboo spout and the plug for it with rags is a source of danger; some of the water, when being let out, must flow over the hands of those removing the plugs. It was recommended that iron tanks of a suitable size, with covers to the openings, and taps, should be substituted, and the subject will be made a matter of special reference. The present state of the station hospital is far from satisfactory, the upper floor having to be disused owing to leakage of quantities of water through the roof, the condition of which is, it is thought, dangerous. An estimate for re-roofing the main building with Mangalore tiles is under consideration. *India*

Belgaum District.—*Belgaum.* No disease has been specially prevalent amongst British troops during the year. There has been a smaller number of admissions for venereal disease, viz., 262 cases up to 2nd December, as against 319 last year for the full year. There were 2 cases of plague within a week amongst the British troops; after removal from barracks, no further cases occurred. 49 cases of plague occurred amongst the two native regiments, and over 300 cases amongst other natives living in cantonment. Drainage within cantonment is satisfactory; that of the sadr bazar is being steadily improved, it having been decided to set apart a fixed sum yearly until the work is complete. One of the trenching-grounds still remains

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uncultivated; it is, however, well removed from barracks, outside cantonment. It has been recommended that the wood-work of latrines and urinals should be replaced by iron, and that night urinals should be provided with iron troughs. The cookhouses and latrines of the married quarters in the British Infantry lines are under the same roof, which is objectionable; separate latrines should be built. These and other defects in latrines and urinals the District General Officer Commanding states will be remedied during the current year as far as possible. A scheme for acquiring ground suitable for constructing *dhobies' ghâts* (referred to in last year's Report as insanitary) is now being prepared. The milk and butter supply of the station hospital has been much improved, cows having been specially purchased for the purpose, and a well managed dairy is in use.

Bellary.—Malarial fevers, as usual, interfered considerably with the health of the troops stationed at Bellary, so much so that 75 men of the Royal Warwickshire Regiment had to be sent for change to Wellington. There are now no defects in the mode of drawing and distributing the water supplied to British troops; the water is obtained from an artesian well and is of excellent quality. Pumps and taps have been supplied to prevent its being handled by water carriers. The recommendation (referred to in the previous year's report) made by the Lieutenant-General Commanding the Forces, Madras, that the Cantonment of Bellary should be separated from municipal limits has been sanctioned by the Government of India. Steps are being taken to define the limits of cantonment. This will enable the provisions of Cantonment Code of 1899 to be applied, and will, it is hoped, not only result in improved sanitation but in a reduction in the number of admissions for venereal disease. The following points have attracted attention and have been brought to the notice of the District General Officer Commanding:—

(*a*) The advisability of replacing the wooden water carts now in use by iron ones. (*b*) Unused wells in the British Infantry lines should be covered. (*c*) Galvanized iron partitions should be placed in urinals instead of wooden ones. (*d*) The sanctioned provision of gauze doors to kitchens should be carried out. (*e*) The land used for trenches in which to bury excreta should be cultivated if possible. This has not been done at present owing to disputed ownership of the land and to climatic difficulties and lack of rain.

Madras District.—As regards the stations in the Madras district, there is little to note, except the question of the water supply of Fort St. George. The health of the troops and the sanitation at *Poonamallee*, *Pallaveram*, *St. Thomas's Mount* and *Fort St. George* have been satisfactory, with some minor exceptions which have been brought to notice and will be remedied.

At *Fort St. George*, the new R.A. building, now under construction, will, it is thought, shut out air from the lower rooms of the neighbouring barracks, and attention was called to this. As was noted in the previous year's report, the supply of water to the troops in Fort St. George is a double one, that for drinking and cooking purposes being derived from the Red Hill Reservoir, which supplies the greater part of the city of Madras; that for washing purposes comes from the "seven wells" in Black Town. Both these supplies are laid on to standpipes, being marked for "drinking" and "washing" respectively. In April, 1900, Major A. M. Davies examined the above supplies and came to the conclusion that "the drinking water supply for Madras (including Fort St. George) is not altogether satisfactory, as it is liable to contamination at its source (the Red Hill Reservoir draining cultivated land and having villages immediately on its banks) and during transit to the city (the delivery channel being open throughout)." Major Davies stated that, in his opinion, it was desirable to stop cultivation throughout the catchment area, and to remove villages that at present drain into it; also to protect the delivery channel from contamination. The "seven wells" supply he found to be exposed to great chances of pollution, but that, if protected from gross

contamination at the source, the water would be a good one. If these wells are continued to be used, he recommended that they should be cemented, covered and fitted with pumps. As it appears, however, that owing to various circumstances, there is little probability of the Red Hill supply being rendered safe within any fixed time, the improving of the "seven wells" supply is being considered. As much of the Fort ditch (see previous year's report) as can be filled without interfering with existing system of surface drainage has been done. Nothing further will be done until it is finally decided what system is to be adopted for the disposal of (*a*) sewage, (*b*) surface drainage of Fort St. George. The question is still under consideration.

RANGOON DISTRICT.—*Rangoon.* Generally speaking, there has been no change of importance throughout the year. The rainfall was rather above the average. The monsoon, failing somewhat in the earlier months, was very heavy later on, and concomitantly sickness increased. As regards the cantonment, Lieutenant-Colonel R. H. Forman, R.A.M.C., in charge of the station hospital, writes :—"The same method of sanitary control is pursued, viz., the division of the cantonment into sanitary circles, each under the direct control of a medical officer and an inspector, and the whole under the senior executive medical officer. Experience has induced some improvement, but the system itself cannot be commended." The Cantonment Committee suggest that, as Rangoon Town has a special health officer, and under him a complete organization, the sanitary duties of the cantonment should be placed under him. This would ensure continuity of supervision, expert management, early detection of zymotic diseases, more efficient registration and notification and improvement generally. In this the General Officer Commanding Burma and the Principal Medical Officer concur, and the matter will be submitted to the Lieutenant-General Commanding. The general sanitation, though still defective, has, as Lieutenant-Colonel Forman writes, "improved during the year, *e.g.*, new 'Crowley' carts have been provided, the universal use of air-tight filth receptacles has been insisted upon and a more effective manner of dealing with nightsoil instituted, *i.e.*, it is 'mounded' at a distance and the deodorized product used in the cultivation of india-rubber trees." The drainage of the cantonment should be connected with that of the town when the "Shone" system is completed, more particularly the sadr bazar. This bazar is overcrowded, its conservancy is defective, and through the centre of it a *nullah* runs which, except when flushed by the rains, is a public nuisance. The Bahan bazar is equally insanitary, but under the new curtailment scheme, it will be excluded from cantonments and come under the sanitary administration of the municipality. The barracks, as a whole, are very good, those for the British Infantry are built on the best site in Rangoon. The Royal Artillery barracks are not so well situated, but there is nothing insanitary in them. One barrack-room and one married quarter of the Royal Artillery are old and ill constructed. In the vicinity of the Royal Artillery lines, there is some swampy ground, which the Cantonment Committee recommend should be drained or filled in. Drainage around barracks is by cemented drains, good in British Infantry, but old and in a bad state of repair in the Royal Artillery. The slope in almost all drains in Burma is defective, the gutters generally being a dead level. During the year an improvement has been made in the Royal Artillery barracks in the disposal of refuse water from the kitchens and bath-rooms, masonry drains have been constructed, and the water led to masonry receptacles at a distance, which are fitted with pumps by means of which the water is distributed over gardens. As regards the water supply, Lieutenant-Colonel Forman writes :—"This is the chief sanitary defect connected with the troops. The water is obtained from wells, which are all shallow or comparatively so. In the Royal Artillery lines a pump has lately been fitted, but it requires four men to work it. In the British Infantry lines there are three pumps. Nowhere is there any pipe connection, and there is everywhere too much manual labour employed in distribution. Moreover, in the dry season the well supply is apt to fall, necessitating the utilization of extraneous supplies, notably the Royal Lakes, a source which can be

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unhesitatingly condemned." The remedy is artesian wells. These wells in some parts of Rangoon have proved successful, and it is hoped that successful borings will be made in cantonment soon. In the meantime, every possible precaution is being taken to render the present supply pure. Larymore boilers are used, *mussacks* are prohibited, &c. The station hospital is suitable, but the family hospital is a tumble-down building. A more suitable building has been sanctioned. A small and in every way suitable ward has been assigned for sick officers, but not being authorized, there is no equipment; sanction for this has been applied for.

Thayetmyo.—The system of the disposal of nightsoil at Thayetmyo has not been according to Regulations. It appears that the sewage was being put in pits about 5 feet long, 4 feet deep and 2 broad. These were roofed with branches except at one end where the sewage was poured in, and then about 6 inches of dry earth thrown over. When nearly full, the pit was closed with branches and earth. The result, however, led to no ill effects, as the ground was far removed from all buildings or source of water supply. This system has since been rectified. Otherwise, the condition was satisfactory.

Meiktila.—Major W. B. Thomson, R.A.M.C., in charge of the station hospital, writes:—"The general sanitary condition of the cantonment may be considered satisfactory." The situation is dry and well drained. The conservancy arrangements have been well carried out. There has been an almost entire absence from the sick returns of all diseases attributable to errors in sanitation, defects in the water supply, diet or clothing. The water supply is subject to much pollution; the chief sources, however, are derived from the margins of the lake removed some distance from the military. The more local defects are the presence of officers' quarters, with servants' latrines attached, situated on the margin of the lake, and the bazar in connection with the native infantry situated on a portion of ground with its slope towards a small inlet of the south lake. In the heavy rains, too, a considerable amount of surface washings from the vicinity of barracks must of a necessity find its way into the lake." This latter could be rectified by the construction of an intercepting drain. A new pipe water supply is now under construction, and a mixed committee has been appointed by the Local Government to inquire into and report on the conservancy of the water supply. During the last year the rainfall was abundant, but through some error far too much water has been taken from the lake for irrigation purposes, with the result that miles of shore, generally covered, were at the end of the year bare mud. There is, however, little possibility of failure of water, and no bad results seem to have been caused by the exposure of so much shore. Steps have been taken to prevent a recurrence of this.

Mandalay District.—British troops have, pending the sanction of the Government of India, been withdrawn from *Bhamo*. Should British troops be located there again, the drinking water well should be covered; an estimate for this and for providing pumps has been sanctioned.

Shwebo.—No disease has been especially prevalent during the year. The sanitation of barracks and hospital is well attended to. As has been mentioned in previous reports, the water supply is unsatisfactory. One well has supplied drinking water for the past three years, but it contains too high a percentage of solids to be quite a wholesome drinking water, and there is not enough of it for cooking and washing. The result is that water for the latter purposes has to be obtained from a reservoir which yields water of a fairly satisfactory character. Unfortunately, in the rains it communicates with the King's Tank, which, according to Major A. M. Davies, yields water of a dangerous character and unfit for use by the troops. This officer recommended in October last that "(1) steps be taken to stop contamination of the reservoir water from the impure tank water; (2) that the clean catchment area draining into the reservoir be measured and its field cultivated; (3) that trial borings be made to find water of good quality in or near the cantonment." The matter is still under consideration.

Mandalay.—The general health of the troops during 1900 was distinctly bad. The ratio per 1,000, compared with last year, reads as follows :— India.

	Admissions.	Deaths.	Invalids sent home.	Constantly sick.
1899	1,979·6	4·85	33·98	106·09
1900	2,372·7	25·32	103·30	127·65

The chief cause of sickness was malarial fevers, commencing in July and increasing steadily throughout the rest of the year. Lieutenant-Colonel O. E. P. Lloyd, V.C., R.A.M.C., writes :—"So severe became the epidemic that the 2nd Battalion Durham Light Infantry were rendered unfit for almost any garrison duty, and, as a military unit, the regiment became useless. In addition to a full hospital, convalescents and transfers to the number of 350 men had to be sent to out-stations. Eventually the regiment lost heart and the physique became so low that it had to be removed to Wellington." A notable feature in this connection is the fact that the men of No. 9 Mountain Battery, whose barracks are situated on sloping ground at a slight elevation above surrounding country, outside the fort, were practically free from malarial fevers. Amongst the men of this battery, a slight outbreak (13 cases) of beri-beri appeared. The cause of the outbreak could not be traced. It was thought that it might be peripheral neuritis, due to arsenic in beer, but examination of the beer gave a negative result. Curiously enough, the native drivers living in the same lines and the inhabitants of adjacent villages did not suffer. Enteric fever only caused two admissions, notwithstanding the unsatisfactory sanitary condition of Fort Dufferin. The cause of the marked prevalence of malarial fever at Mandalay is no doubt due to the infantry barracks being situated on a marsh, a locality so notoriously unhealthy that, in King Thebaw's time, it was abandoned by the Burmese. Fort Dufferin, in its present state, is not desirable as a cantonment for troops, especially European. The situation of the British Infantry barracks and hospital is the worst in the fort, being lower than the other parts and practically water-logged, if not a lake, after heavy rains. This will probably be much improved by the outlet now under construction, but, in addition to it, drainage is required, and it is doubted whether surface drainage would be sufficient, and the expense of deeper drainage would be great. The saturated soil lowers the physique of the men and renders them liable to any disease prevailing, especially ague. The numerous canals all about are an ideal breeding-ground for anopheles (which have been found in numbers) and ague is thus easily spread. If the canals were filled in and water distributed by pipes to dipping wells over the fort, and the drains kept clean, the mosquito danger would be reduced, but the fall is practically so slight that it would still exist. The water supply is everything it should not be and is practically as described by Major A. M. Davies, R.A.M.C., except that steps have been taken to prevent pollution from the *dhobies'* washing-place. The presence of the native city all round the fort is not a diminishing danger, and, should enteric fever be introduced, and the boiling of drinking water not be carried out with scrupulous care, the results would probably be alarming. The proposal to supply drinking water from deep wells is yet only in the experimental stage, and, though successful, the fact remains that the barracks are situated on fouled soil. If military reasons do not necessitate the continued retention of a European garrison at Mandalay, the removal of the troops to Maymyo should receive every consideration. The place, though having only about 4,000 feet elevation, is a plateau openly wooded and with good natural drainage. Though the experiment of sending troops there some years ago was not a success, it was because they were housed in a manner quite unsuitable. The locality is in all respects well suited for a cantonment; it is on a line of rail and

India - practically of limitless extent; as far as can be learnt, fever does not prevail. The proposal to have some blocks built for British troops should, it is thought, be at once carried out, if only for use as a sanitarium. Fireplaces or stoves should not be forgotten. The Royal Fusiliers, who have lately replaced the Durham Light Infantry, are showing increasing admissions for ague, and one-sixth of the regiment are at present in hospital. Since the above was recorded, 50 men of the Royal Fusiliers have had to be sent to Maymyo for change, and sanction has been obtained for the move of a wing of the regiment from Mandalay to Meiktila during the unhealthy season. No structural changes of any importance have been made during the year, but a culvert to remove surface water from the interior of the fort at the north-east corner is under construction.

BOMBAY COMMAND.

The Principal Medical Officer, Surgeon-General W. S. M. Price, A.M.S., in his general remarks on the sanitary conditions in the Command draws attention to the following points:—

He considers the present means of ablution are insufficient and inefficient and advocates the erection of well established baths with hot and cold water laid on in all barracks, hospitals, and military prisons. He also urges that kitchens should be properly fitted up—the present dirty sheds with bad uneven floors and clay-built, smoke-begrimed walls, being insanitary and bad in every way. He is of opinion that the latrines should, in all cases, be fitted with "automatic earth boxes" as the only method of insuring the proper use of the dry earth system; and that receptacles for nightsoil should be removed bodily, and not emptied into carts brought round, a duplicate set of receptacles being provided. As regards the disposal of nightsoil he condemns all systems of trenches, believing them to be a fertile source of infection, through air borne mischief, and considers the septic tank system the soundest. He suggests that iron latrines, when fixed and incapable of frequent removal, should be built on a plinth with a concrete floor, shelving off into an encompassing drain leading into a receptacle; that the floors should not be of earth, but of some material that will stand being washed down with disinfecting fluid; and that all latrines, whether iron or masonry built, should have free ventilation at the ground level and at a height of say 6 feet. He thinks that all *dhobies ghâts*, or troughs, should be made so that water can be changed readily, as clothes never get a fair chance of being thoroughly cleansed by the method of washing which at present obtains in some stations. He advocates a system of three troughs at different levels, so that water could be passed on from one trough to another and the clothing finally rinsed in clean water in the upper trough. In connection with the storage of water he refers to the "Report on Sanitary Investigations and Bacterial Examinations at Poona," by Major A. M. Davies, R.A.M.C., wherein it is stated that "the only way, in my opinion, in which the water can be treated safely, is to cool it as rapidly as possible after boiling, in some earthenware vessel protected from dust; when cool, to place it in the MacNamara tubs, then add the permanganate of potash and lock up. Such water will be safe, but not so palatable as if stored in *chatties*." The Principal Medical Officer takes exception to that recommendation, inasmuch as at many stations in India, water so cooled in *chatties* and then put back into MacNamara tubs would again become so heated as to be quite undrinkable, for the reason that the temperature in a verandah or barrack-room may range at anything between 90° and 110° F., and the MacNamara tubs are practically of the same temperature as the external air. He considers, therefore, that the water should be carried straight from the Larymore boilers in metal buckets specially kept for the purpose, to the MacNamara tubs, be kept there till it has cooled as much as it will, be then treated with permanganate of potash, and drained off into *surahis*, where it will undergo the final cooling and con-

sumption. The issue of these *surahis* is authorized by Army Regulations, India, for barracks where pipe water is not laid on, and as men are not supposed to drink the water direct from taps, they should also be authorized in the event of Larymore boilers being employed. With regard to bakeries, he recommends that, with a view to ensuring absolute cleanliness, there should be ample means of ablution (hand-basins, soap, towels, &c.) and finally a vessel with a supply of permanganated water, for final rinsing of the hands. *India.*

Poona District.—*Poona.* The general health during the year has not been good, owing to prevalence of enteric fever and cholera during the monsoon months, as also to the great increase of venereal disease as compared with 1899. The death rate has been far in excess of that of 1899; this has been due to enteric fever and cholera, 16 and 19 respectively. Wanowrie Barracks, as usual, furnished the majority of admissions for enteric fever, viz., 37, 6 only coming from Ghorpuri (sporadic cases). None of the non-commissioned officers or men who had been inoculated with Wright's Anti-typhoid vaccine during 1899 and 1900 were attacked. Several theories were advanced for the prevalence of enteric fever last year in the Wanowrie Barracks in Major Davies' report, and it was put forward in the previous year's report that the city filth-pits to windward might be a source of air-borne infection. The officer in charge station hospital states that he considers the epidemic which has taken place to be due chiefly "to defective storage, treatment and distribution of water, to faulty construction of water-pipes, to insufficient conservancy establishment and faulty location of latrines, and probably also to the regimental dairies." Barracks and institutes, canteen, &c., are in good sanitary condition, in excellent order and well looked after. The Principal Medical Officer, at his first inspection of the Wanowrie Barracks, particularly noticed the excessive number of latrines scattered throughout the barracks; these were often very offensive during hot weather, and the Standing Barrack Committee assembled to consider a proposition put forward by him for centralization of the latrines, with consequent economy of conservancy establishment, tending to a more thorough carrying out of their duties. The establishment was insufficient for the number of latrines. The alterations proposed by the Standing Barrack Committee referred to above have been submitted to Government for orders, and is now, it is understood, under consideration. It is laid down in Regulations that the "distances of latrines from barracks should not be less than 20 or more than 50 yards in the plains or hills, and that their position will be affected by the direction of the prevailing winds, nature of the locality, size of the latrines, &c., &c." The Principal Medical Officer considers these distances dangerous, and thinks the minimum should be 50 and 100 yards, according as latrine is to leeward or windward of a barrack; the maximum, any convenient distance, but as far as possible. Soldiers will not carry out the dry earth system properly, and nothing less than automatic earth-boxes will ensure the proper observance of the system. He is also of opinion that an excessive number of latrines with an insufficient conservancy establishment and consequent insanitary conditions and a dangerous proximity to barracks as very probable factors in the causation of enteric fever. The water supply of Poona can hardly be considered above suspicion. It comes from the Kharakwasla Lake, 10 miles distant, in an open canal, to which natives can and do obtain access throughout its length, and though any pollution may be so diluted as to be innocuous, still, the danger of pollution is ever present and cannot be disregarded. Although very much has been done of late years to improve kitchens, still it is considered that there is much room for improvement in kitchens generally—many of them have very indifferent flooring, and have smoke-blackened walls—and all of them should have tin-topped or marble-topped tables (Neemuch marble), for the cutting up and preparation of food, &c., also meat safes. The present pattern of safe let into the wall and open to the outside air on one side is faulty, and allows all the outside dust to be blown into the safe. Lavatories are well kept and good as far as they go. Every barrack ought to have a complete system of baths with hot and cold water laid on, towels supplied, &c. The dairy is well looked after, clean, and in excellent condition, but always open to the objection that butter has to be procured from outside when the dairy

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is unable to meet the demand. The Ghorpuri Barracks are of three types—the third type being rather low, badly lighted and on insufficient plinth. Barracks generally are situated on cotton soil and are said to be unhealthy in consequence. The married quarters are suitable and accommodation ample, but ceiling cloth or boarded ceilings are much needed, though not authorized. Barracks, institutes, &c., are well kept and in excellent order, but the buildings for canteen and infant school are bad and capable of much improvement. The same remarks apply to the lavatories, &c. In these barracks, as in the case of Wanowrie, latrines require free ventilation at ground level, but are not crowded up as in the case of Wanowrie Barracks. The Ghorpuri bazar and a village of the same name are objectionably near barracks. The latter is under no proper sanitary control and is a source of possible disease. Representations have been, and are being made to the civil authorities, but as yet no satisfactory arrangement has been arrived at for improving the state of affairs. At the military prison (Wanowrie) the percentage of sick has been large, 23·26 per cent. The admissions to hospital have shown a percentage of 88 among short term prisoners (under 42 days) and 31·7 per cent. among long term prisoners. This is ascribed to the insufficient and meagre diet of the short term prisoners. The matter has been fully brought forward and is now under the consideration of Government. The prison is situated on the highest ground in Poona and ought to be healthy. Some recommendations have been made on sanitary points. The station hospital with its Sections No. 1 and 2 is out of date and inconvenient, faulty in construction and badly arranged. A scheme is on foot to build a suitable hospital in a central position which will accommodate the sick from both barracks, but it is believed that the cost will be prohibitive. Poona cantonment itself is very much crowded up in parts, and private latrines are dotted about in most conspicuous places. This could only be rectified by a "grouping together" of latrines. It would be difficult and expensive, but it is thought great improvement would be gained, as some latrines are at present in public spots and very objectionable. Another possible, if not probable, source of disease is said to be the vigorous sweeping that goes on at very early morning at certain times of the year. The stagnant air is filled with clouds of choking dust, and when it is remembered that "*poudrette*" is freely carted through cantonments at night whenever required anywhere for purposes of cultivation, it naturally follows that any that may fall out of over-filled carts helps to form the *dust-cloud* that may be seen any morning in Poona in the hot and dry weather. A well established laundry is a much needed want for corps and hospitals; a drying-room should always be provided.

Kirkee.—The general health has been fair—malarial fever and venereal have been the prevailing diseases, and there were 16 cases of enteric fever, for which no cause could be discovered. The barracks are suitable, with some exceptions, and well situated on high, well drained ground; they are kept in good sanitary condition. There has been some overcrowding of the British Infantry detachment, who are located in a converted "patcherry," but a scheme is now under consideration for building new and remodelling existing buildings. Beds are said to be infected with bugs, and boilers seem to be necessary. The water supply is from the Pashan Tank, four miles away; the quality is good, though very turbid in the rains. The latrines and urinals are well cared for. Some latrines have been more freely ventilated by making long low openings in the walls of the latrines at ground level, as also in the screening walls at the back; this simple method ensures a more thorough aeration of the flooring of the latrine, which frequently gets very foul, and should be adopted generally. Some few latrines for native followers should be erected in barracks to prevent them fouling the ground. Conservancy establishment is insufficient. Urinals should be generally adopted on the trough pattern, a broad V-shaped trough running into an outside receptacle; these, if the trough is properly attended to, are the least offensive of any, excepting those with a constant trickle of water, which are not suitable for this country. Kitchens were in some cases in excellent order and really well looked after, but the remarks on Poona kitchens apply equally to Kirkee. A laundry is much needed for

barracks and hospital. The Principal Medical Officer regrets that the *Syces'* lines have been rebuilt on the same site, and will, it is thought, continue to be a source of disease and danger as heretofore. The institutes are very well administered, and supplies generally seem to be of the best procurable. Additional accommodation is much needed at the station hospital; a new roof has been asked for. The servants' quarters are insufficient and require ventilation. A mortuary is very much needed in connection with the native section. *India.*

Ahmednagar.—The general health was indifferent, owing to venereal diseases, enteric, malarial fevers, &c. Enteric is said to have been due to "a deficient water supply (always liable to pollution), imperfect conservancy, and insanitary conditions in the vicinity of cantonment." There were no cases among those who had been inoculated in the previous year. The accommodation for British Infantry is not sufficient; additional buildings have been recommended by the Standing Barrack Committee. The present buildings are faulty in location and arrangement, too crowded together. The married quarters are insufficient, and some families are placed in the R.A. barracks. The doorways are too low and require raising, and the means of lighting very defective. The cookhouses and latrines are too near each other and too near the quarters themselves. The lavatories are of the usual type and said to be sufficient and suitable, but the lavatory in the Fort Barracks is unsuitable; a new one has been estimated for. Kitchens are very indifferent; there are no wire gauze to doors, windows or openings, no meat safes, and no proper tables. The latrines in the fort are badly situated and too near the men's quarters; this has been brought to notice. In the British Infantry married quarters the latrines are much too near the kitchens, and too near the quarters themselves. In the R.A. lines the latrines are much too near the cookhouses, and recommendations have been made that the present latrines be abolished and a general latrine (for the three blocks), be built about 80 to 100 yards south of the skittle alley and well away from the barracks. The conservancy establishment generally is quite insufficient. The water supply is not satisfactory and is at times scanty. It is said to be liable to pollution at its source and along its course, specially at the open shafts and dipping wells, as it runs through Bhingar village. The Bhingar Duct which supplies cantonment runs down from the reservoir which has been formed by a Bund run across the valley between the villages of Kaprwadi and Bhingar. The bed of this tank was fouled by the burying of excreta in deep trenches in the bed of the tank. These have been cleaned out, and 6 inches of quicklime have been placed in them with the object of purifying them. The catchment area of this tank includes the large village of Kaprwadi and several hamlets, as well as a large tract of cultivated land. The excreta of a large famine camp below the tank were also buried in pits in the vicinity of the aqueduct; these too have been cleaned out recently and quicklime applied. During the water famine this supply ran very low and had to be aided by wells sunk in the bed of the nullah as well as from private wells. A recommendation has been made, among others, that the water should not be allowed to accumulate in this Kaprwadi tank for the first year, so as to allow the polluted bed of the tank to purify itself. At the station hospital an officers' ward is much needed. A suitable site is available to the westward of the junior assistant surgeon's quarters. The latrines require free ventilation generally. The servants' quarters are insufficient, overcrowded, and at both the station and section hospital they are too near the hospital wards. There are several sanitary defects in this cantonment, viz.:—The objectionable proximity of the city filth-pits to west and to windward of the R.A. and British Infantry barracks. The proximity of the Bhingar filth-pits. The insufficient and unsatisfactory water supply, with its constant liability to pollution at several situations. The faulty location, arrangement and construction of latrines in barracks themselves, and their dangerous proximity to cookhouses.

Satara.—The general health has been fair. Venereal and malarial fevers have been the prevailing diseases. The British Infantry barracks are good and well kept up, at right angles to the prevailing wind and well raised above ground level. The latrines require free ventilation, and in all cases

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duplicate earthen pans should supersede iron ones. The kitchens were
good order. The water supply is from Kâs lake, fourteen miles away. T
fort barracks consist of a double-storeyed building, which was an old pala
and are about 1,000 feet higher than the plain below. There was a stagna
tank in the fort enclosure which has been drained. There are two more st
undrained, which may breed mosquitoes. The latrines require some venti
tion at ground level. Nightsoil is thrown over the fort wall; this has be
brought to notice and should be stopped. Water is derived from a well
the fort, which ran dry during the drought. The station hospital is good a
suitable; but servants' quarters are required for assistant surgeon's quarte
and water should be laid on to the mortuary. There is a colony of municip
sweepers and their families located in a dirty and overcrowded hut within
few yards of the hospital servants' quarters. Small-pox appeared amo
them, and two men of the Army Hospital Corps were taken ill with t
same disease. These families should be removed, as they are a consta
source of danger.

Purandhur Sanitarium is situated at 4,564 feet above sea level, with
rainfall during 1900 of about 45 inches, and distant from Poona about
miles south-east. It possesses an undoubtedly salubrious climate compar
to the surrounding stations in the plains, and has a very beneficial effect
the health of men sent up for change; this is evidenced by the gain
weight in 148 out of 222 men sent up—the average gain of weight is said
have been 15 lbs. per man. The Principal Medical Officer has always urg
that the utmost use should be made of this sanitarium. The general heal
has been fair, and the average strength of convalescents during the ye
103. The barracks are very good, substantial and airy, with ridge ventil
tion. They can accommodate 146 men; and by using the verandah
218. The latrines generally want free ventilation, by openings in wal
at ground level. The cookhouse is too small, and the lavatories a
of the usual type, but not sufficient. Drinking water is obtained from fo
covered wells (kept locked, except at certain times during the day), boile
"pinked," &c. Water for other purposes is obtained from uncovered well
Nightsoil is buried in pits; at one time it was put in trenches and cultivate
but for some reason or other this practice was discontinued. The stati
hospital is equipped for 40 men, 3 women, 3 children. The walls of the tw
wards might be raised and clere-story windows put in. The latrines ha
been recently ventilated as recommended. This hospital could accommoda
many more sick, but the journey of 20 miles is a drawback in the case of a
serious case of illness.

Bombay District.—*Colaba* is situated on a narrow tongue of land runni
out into the Indian Ocean, and in a densely crowded locality, which is und
municipal laws and regulations. The Royal Garrison Artillery barrac
consist of two double-storeyed and six single barracks on a high plinth, b
leaky as to their roofs, very crowded up, one barrack being directly in fro
of, and quite close to, the new station hospital, and with very insanitar
surroundings in the shape of native houses. A suggestion has been made
level every alternate barrack, and convert the remaining barracks in
double-storeyed buildings; this would open out the ground very much, a
be a vast improvement. All the native houses behind the married quarte
should be done away with; they are, it is believed, private property, but it
thought they should be bought up, and suitable quarters under prop
sanitary control should be erected. The latrines should be freely ventilate
at ground level, and wherever else necessary, and the conservancy establis
ment should be increased. Urinals should be on the inside trough a
outside receptacle system, and all catch-pits should be abolished. Kitche
should be better equipped, and fitted with wire gauze. The British Infant
barracks comprise four double-storeyed barracks in a good and airy site
the western shore of the aforesaid tongue of land. The latrines are in so
cases too near barracks, and require freer ventilation. A suitable dairy
very much needed. The depôt barracks consist of two single sto
buildings, and are as well cared for as their surroundings will admit
Several minor sanitary defects have been brought to notice, and will
rectified as far as possible. The station hospital is a new and palati

building, opened 13th June, 1900, and equipped for 120 beds. There are, at present, no operating room, laboratory, or officers' ward, and the mortuary is close to and almost adjoining the south end of the building. It is proposed to convert this into a disinfecting chamber, and build a new mortuary on some more convenient site. At the station family hospital a kitchen is urgently needed; at present everything has to be brought from the station hospital kitchen, and arrives quite cold. The water supply is from filter beds at Malabar Hill, and comes from the "Toolsi" and "Tansa" reservoirs. It is considered that the water should be thoroughly boiled in Larymore boilers, inasmuch as a considerable number of young recruits pass through the depôt, and though it is said that Colaba is not an enteric station, still it is quite possible that drafts may contract the disease at Colaba, and not develop it till they have passed up country.

Deolali is situated 2,000 feet above sea level, 114 miles from Bombay, near the Western Ghâts, in a healthy and bracing climate, with a rainfall of 30 inches. This is the chief depôt for troops, drafts proceeding up country, and for invalids and time-expired men homeward-bound. The barracks and institutes are in excellent order and in good sanitary condition, everything being well looked after and cared for; tents are used during the trooping season. The water supply is from wells; two are covered in. Water is pumped from them into large tanks, and is said to be rather hard. The station hospital accommodation is insufficient, only for 62 patients; additional accommodation is very much needed for 100 more patients at least. Outhouses are badly arranged, store rooms much needed, servants' quarters too near the cookhouse, and more quarters should be built in the general line of servants' quarters. Drugs store-room is so dark and small as to be practically useless, and there is no proper place for seeing the morning sick. Administrative offices are much needed, more accommodation generally is required, and generally speaking the hospital is not worthy of a large depôt through which the bulk of Indian invalids pass. Though not sufficiently elevated to be called a sanitarium in the strict sense of the term, it might be used freely as a health resort for men from Bombay and elsewhere during the hot weather and rains. The extension of the G.I.P. Railway to the hospital has been commenced; this will prove a great convenience to invalids, and will land them at the hospital itself.

Khandalla.—This station is 2,000 feet above sea level, situated at the top of the Bhore Ghâts. It is used as a health resort for troops from Bombay, &c., and is open from October to June of each year; it accommodates 175 in barracks. The barracks are excellent and in good condition. The latrines require ventilating. The kitchens are very indifferent, smoky, and not well fitted up, requiring thorough renovation all through; the same may be said of the kitchens at the station hospital. Water is supplied by pipes from G.I.P. Railway reservoir at Bookor, four miles away, and is good and abundant. The hospital is good and clean. Catch-pits should be done away with outside all kitchens, and receptacles of a suitable size substituted; some of those in present use are so heavy and cumbersome as to make the spilling of their contents a certainty when lifted. The mortuary is in the hospital building; this should be converted into a store-room and a mortuary built at some distance from all inhabited dwellings.

Mhow District.—*Mhow.* Health was not so good as in the previous year. Sick rate and mortality rates were higher; the former due to increase of malarial and venereal diseases generally, and the latter to cholera. There was a sudden outbreak of this disease in August; 9 men and 2 women were attacked, 8 men and 2 women died. The first cases occurred in houses at some distance apart, and no communication could be traced. The disease suddenly broke out in the sisters' ward of the section hospital, 7 patients were attacked out of 11; these were chiefly suffering from bowel affections, and the milk supply is strongly suspected of causing the outbreak in the hospital. There was a large increase of venereal disease due to famine-stricken women frequenting the cantonment. The barracks are in good sanitary condition. Recommendations were made as to the better equipping and fitting up of kitchens generally; some are being carried out, others are either awaiting funds or are not authorized. Objection was taken to the present system of

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safe let into kitchen walls and open to the outer air on one side; representations are being made on this point. It was also pointed out that all kitchens should have sculleries with the sinks in the scullery, not in the kitchen, but they seem to be authorized only for station hospital and regimental institute kitchens and not for barrack kitchens, a distinction that is not easy to comprehend. The latrines generally are in very good order; some had been improved by ventilation during the year, others required more ventilation. Automatic earth boxes are strongly recommended. The water supply ran very low in the Bhaircha tank on account of the deficient monsoon rain, and a large quantity of vegetable and other *débris* in the water is supposed to have been responsible for a considerable amount of bowel disorders during August; these ceased in September when the water cleared up. Filter beds at the reservoir have been frequently recommended. The head of water is said to be too low to force the stream through filtering beds and afterwards carry it to the expense reservoirs in cantonments. A scheme is on foot to cover in the reservoir in the Infantry barracks with corrugated iron to prevent dust entering. Enteric fever furnished 35 admissions and 6 deaths. The gymnasia are not good; they are situated in the ground floor of barracks, are not sufficiently airy or well ventilated. Some improvements will be made in the way of ventilating them, and floors are being or will be boarded. The meat rations were not good. Vegetables were procurable in plenty, only at certain times of the year. The station hospital is in very good order, but infectious wards are very much needed. In bakeries, without exception, ample and efficient means of ablution should be provided for all employées, specially the kneaders. Water, soap, towels and water "pinked" with potash permanganate for final rinsing of the hands should be made use of. The cantonment dairy supplies a great need, but at times the demand outruns the supply and outside milk has been brought in; this has been discontinued. The Allahabad system for the disposal of nightsoil, &c., is in vogue.

Nasirabad.—An unhealthy year, with a prolonged hot weather and rainfall above the average. The station is 1,460 feet above sea level. There were 1,461 admissions and 32 deaths as against 733 and 15 in 1899. There were 56 cases of enteric and 21 deaths, and 5 deaths from cholera. The cases of enteric fever were very evenly distributed among British Infantry and Royal Artillery, and occurred in every month throughout the year except June. April and September, however, furnished 14 cases each. No definite cause was ascertained. The water supply is apparently from two sources; one, for drinking and cooking purposes, is the Dilwara well in charge of the cantonment authorities, about two miles distant. Natives also draw from this well as it is only rented. The other source, "the Danta well" in charge of the M. W. D., is five miles distant from cantonments and about half a mile distant from Danta village itself, which is situated to windward of the well. Enteric microbes have been found in this well. A new well close to the above has been sunk recently; the water, however, is too brackish for drinking purposes and contains a large excess of chlorides due to lime. It is proposed to allow natives to use it for irrigating purposes, in hopes that the chloride will decrease. Water from the "Dilwara" well is brought in iron tanks on bullock carts, while the "Danta" water is conveyed by gravitation to a reservoir and thence by pipes to barracks and bazar. These wells are disinfected with potash permanganate once weekly. The pipes are also flushed with it once a month. An increased water supply is urgently needed, and it has been suggested that the "Danta well" could be supplemented by water from the Danta reservoir, and from a large tank at Bir. Artesian wells are suggested. Larymore boilers are in use in barracks. Allahabad system of conservancy is in use, but there is not enough water to keep up continual cultivation. The medical officer considers some other system should be tried, as the present system breeds flies, and he thinks that flies are brought into barracks by the filth carts from the trenches owing to there being insufficient water to cleanse the carts. The Royal Artillery and British Infantry barracks are in good sanitary condition and are well looked after. The kitchens are large and roomy and well kept, as far as possible, but some of them are very smoky, and they all want improving. The institutes are

very good and carefully supervised, mineral water factory especially so. The bakery, dairy, &c., are clean and in good order. At the station hospital a central lavatory is much needed, also a new cookhouse; the present one is outside the hospital enclosure, and across the main road. A sudden outbreak of cholera occurred between August 18th and 20th inclusive; all the patients (6) were venereal cases. Two cases more occurred in barracks; these latter cases had been in hospital in the main building, and the cases occurred at the same time as those in hospital. The commissariat slaughter-house is too near the filth-pits and too far from barracks; it attracts flies from the filth-pits. A new site has been suggested by the cantonment magistrate near the cantonment gardens. The bazar at Nasirabad is stated to be hopelessly overcrowded, and though it has been much improved during the past year, it is still a most insanitary spot; this is in a great measure due to the irregular way in which houses have been built, and also to the latrines, both public and private, being in an insanitary condition.

Neemuch.—Health bad in comparison with 1899—admissions for 1900 being double, due to malarial fever and venereal; average rainfall 35 inches. The kitchens generally are not good. The Royal Artillery coffee-shop cookhouse is very indifferent, and much too small; the sergeants' mess cookhouse, British infantry lines, is very bad in every way and should be rebuilt; the coffee-shop cookhouse is too far away and should be built near the coffee-shop. Water is drawn from No. 26 well near the station hospital, pumped into a reservoir, where it is "pinked" with potash permanganate, then treated with alum (*gr.* viii to gallon). The latrines are very satisfactory. At the station hospital the servants' quarters require ventilation, and a *dhobies' ghât*, &c., much needed. No proper dairy exists, cows having been sold to the Mhow Dairy. Bakery was well arranged and clean, excepting that MacNamara tubs are required, instead of open tubs for storing water.

Indore.—Health generally bad, due to prevalence of venereal and malarial fevers, which gave double the number of admissions that there were in 1899. This station is situated 1,998 feet above sea level. The water supply is from a well in vicinity of barracks; this well is treated once weekly with potash permanganate. The barracks are good and well kept, but there is constant overcrowding. The accommodation is for 100 men, while the average strength was 128. There is also overcrowding in the treasury guard-room. The coffee-shop is small, provisions somewhat scanty, and not sufficient.

Taragarh.—3,000 feet above sea level on Aravelli Range, with a rainfall of about 22 inches. There is a very insanitary village close to barracks with a number of private latrines, and there seems to be no proper supervision over the village. Water is brought up by mules in *mussucks* from the Foy Sagar Lake. There is nothing specially worthy of note. Malarial cases seem to improve rapidly. Hospital accommodation seems insufficient.

QUETTA DISTRICT.—*Quetta* stands 5,500 feet above sea level, with an annual rainfall averaging 12 inches only. With the exception of an outbreak of enteric, the general health has been better than in 1899; admissions have been fewer by 203, but the epidemic referred to caused 129 admissions and 29 deaths. Its origin could not be traced, though two sanitary officers were specially detailed to inquire into the cause. There is grave suspicion that the disease originated in the city from eating-houses frequented by the men, while the medical officer considers that dust may have accounted for it, and that a liberal and a thorough watering of the roads would perhaps prevent it, at any rate, in part. Venereal disease has considerably swelled the number of admissions, but a cantonment hospital has been opened in the city, and it is hoped that this will tend to diminish the amount. The barracks are in good condition and well looked after; some improvements have been and are being made, by the addition of verandahs, and in some cases by improved ventilation above. Those in the Royal Artillery lines are too much crowded together, and it would be a distinct benefit to the whole cantonment if the native cavalry lines could be moved away from their present position, as flies congregate and probably breed there and infest the neighbouring bungalows; it would also be a decided gain if the mountain

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battery could be moved to a site on the north-east aspect of the camp, where it is contemplated to erect lines for another mountain battery. The latrines are of different types. The old objectionable mud types are being removed and iron ones erected as funds permit; these as a rule have mud or earth floors, and are considered insanitary, as in summer they crumble into dust and get blown about, while in winter they get muddy and filthy, and are a source of discomfort. An iron latrine should have a concrete floor (or patent stone), that can be washed down whenever necessary; it should have an encompassing drain, and should be raised on a plinth, so as to allow any water to run off by the drain into a receptacle placed above ground. Quetta, of all climates in India, should have a really comfortable bathing establishment for each corps, comprising hot and cold baths, boiler-house, towels, soap, &c. The present bathing arrangements for British troops are considered quite insufficient. As cooking is now done by soldiers, kitchens might be very much improved in many respects. The dairies are regimental, well looked after and good of their kind; it is under consideration to build one central dairy. The water supply is from Urak, 13 miles distant; the catchment area itself is pure and undefiled as far as can be, though there is some suspicion of possible pollution from leaky pipes, &c., *en route*; the water is brought in by a 7-inch pipe and is said to be insufficient for the wants of the station. It is certain that there is great waste from leakage, &c., during its long course of 13 miles, and probably a third of the water entering the pipes is lost before it reaches cantonments. The military prison is in very good order; latrine wants some ventilating openings. Here also the dietary for short term prisoners is insufficient. The station hospital consists of a series of detached wards spread over a large area. An operation room and good laboratory are necessities; and all latrines should have stone or concrete floors. A laundry, well fitted up, is very much wanted.

DEESA DISTRICT.—*Deesa* is situated 470 feet above sea level—average rainfall 25 inches; average strength, British troops, 185. The general health was bad as compared with 1899; malarial fevers and venereal diseases were prevalent. Three cases of enteric during the year, all recovered; there were no cases among men who had been inoculated, but these were few in number. The barrack accommodation is ample, but sergeants' rooms in British Infantry barracks very small—uninhabitable, but might be improved by partitioning off portions of barrack-rooms at either end; space could be well spared. The latrines are well cared for in every respect; those in Royal Artillery barracks recommended to be moved farther away, also Royal Artillery married quarters latrines to be pulled down and two new ones built at either end. Estimates have been submitted, but nothing has yet been done. The water supply is drawn by a pump from a well, and distributed in iron buckets to the barrack-rooms. There is nothing special to remark on in connection with the station hospital, which is sufficient for requirements.

Ahmedabad has been fairly healthy, considering the amount of cholera &c., in the surrounding district; there has only been one case of enteric fever. The barracks and their subsidiary buildings are distinctly good and well constructed, and there is a good swimming bath. The kitchens are roomy and good; some of the tables, &c., required renewing. The latrines are in good sanitary condition. They require some ventilation at ground level; this will be provided. Water is supplied by the municipality from deep wells sunk in the river bed; it is good in quality and is boiled before issue. The institutes, &c., are in excellent order, and are well looked after. Mortimer bar system of punkhas is being introduced; the present system of pulling them with a heavy iron bar in the middle of the room is useless and objectionable. The gymnasium should have a boarded floor. The station hospital accommodation is ample (34 beds). The latrines require ventilation, and the kitchens require wire gauze to all windows and other apertures.

Mount Abu is 17 miles from the railway, and is situated at 4,000 feet above sea level, with a rainfall that varies very much from year to year. A rough yearly average is 66, while occasionally it has reached 123, 130,

201 inches, during various years. The temperature is said to be 20° cooler than the plains, and seldom exceeds 90° F. or goes below 40° F. The climate is as a rule very healthy, though malarial fevers are said to be very prevalent during the latter months of the year. There are a large number of wells, which give a good and ample water supply, but this year these ran dry, and all the drinking water had to be taken from the "Nakhi Talao," a natural lake of volcanic origin, which has been enlarged and deepened by means of a masonry Bund. The water is generally considered unfit for drinking purposes, but extraordinary precautions were taken to guard it from pollution and keep it pure, evidently with success, as no disease can be traced to the use of this water. A large tank, "Trevor Tal," has been built by the erection of dams, 1½ miles from Abu. It is estimated to hold 50,000,000 gallons of water collected from the hills all round, which are unoccupied and presumably free from pollution; this, it is understood, is intended to supply Abu. A Larymore boiler has recently been erected. The barracks are situated on ground to the north-east of the station. There are 16 bungalows; each bungalow is capable of holding 9 men and 1 non-commissioned officer, but one is taken up for institutes, &c. The General Officer Commanding Deesa District has recently represented that the accommodation for coffee-shop, supper-room, canteen, &c., is insufficient, and recommendations have been made for a new block to be erected to house the institutes, &c. There are two blocks of married quarters, capable of holding 20 and 4 families respectively. There is additional space on a small hill some few 100 yards off, where additional buildings could be erected or where tents could be pitched during the fine weather if required. This is called "Camp Hill Ground." The lavatories, kitchens, &c., are of the usual pattern and are open to great improvement. Wire gauze has lately been put in cook-house windows, doors, &c. The latrines have been ventilated and thereby improved lately; filth trenches are about 600 yards away. The municipality are about to purchase an incinerator, and it is possible that all nightsoil from barracks will be destroyed there. Urinals have been much improved during the past year by the substitution of a V-shaped trough running out through the wall of the urinal, and discharging into a receptacle outside. Owing to famine, rations have been unusually poor; mutton is issued daily and tinned beef once weekly. Beef is not allowed to be killed on the hill. There was no milk or butter obtainable, and only tinned articles were used. A dairy is much needed; three or four cows are kept by the commissariat to supply the hospital. The station hospital is situated on a ridge 300 yards north-west of barracks, a long single-storey building consisting of two wards, for 10 and 6 beds respectively, an isolation ward containing 6 beds, and an officers' ward containing 2 beds. The station family hospital contains two wards for 5 beds. The elevation and climate of Mount Abu make it a most desirable residence during the hot months, or indeed at any time of the year, excepting perhaps at the rainy season. It seems desirable that more advantage should be taken of this hill for troops in the Mhow, Deesa and Bombay Districts. As already stated, additional accommodation could be found for new barracks or huts on "Camp Hill Ground," and the plateau called "Uria" has been several times brought to notice as a most desirable place for troops. "Uria" is five miles from Abu, on the northern end of the spur on which Mount Abu is situated, 4,500 feet above sea level and more open and cooler than Mount Abu. It has been fully reported on, and the question of its occupation for and by British troops is now again being brought forward and depends in a great measure on what arrangement can be come to with the Sirohi Durbar. There seems to be ample space for barracks or huts, and every promise of an amply supply of water. If the scheme were taken up, it would provide for a long-felt want in the Bombay Command and furnish a hill station for troops and weakly men that could not help being of immense value. Mount Abu itself is within easy reach of the line of railway.

NAGPUR DISTRICT.—*Kamptee.* The general health contrasts unfavourably with the health of 1899, the increase in sickness being chiefly due to malarial and other fevers, which are ascribed to an increased rainfall, viz., 59·59 inches as compared with 27·99 in 1899. There were 10 cases of small-pox and 1 death among the men, and 13 cases of enteric with 4 deaths,

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3 cases of meningitis, and a rather unusual prevalence of malarial fevers in April and May. The water supply, which is from wells, is said to be good and ample. Several new works have been completed during the year or are in course of completion, most of them tending to a better sanitary condition of affairs, viz., provision of Larymore boiler, new urinals, latrines, and self-closing doors and perforated zinc panels to doors and windows of cookhouses of Royal Artillery and British Infantry barracks, station hospital, staff and commissariat lines, station gymnasium, &c. The latrines and urinals in many instances are too near barracks and in some cases require freer ventilation.

Sitabaldi.—The night latrines are much too near the barrack-rooms, and should be removed altogether as they are a dangerous nuisance. A fresh site has been selected within the fort walls, removed from the barrack-rooms, but the latrine has not yet been erected. The day latrines are outside the fort wall and require some ventilation. Water is pumped up from the fortified well and from a well in the middle of the fort. The hospital contains six beds and is sufficient.

Sind District.—*Karachi.* The general health was fair. Towards end of year the sick rate was greatly augmented by transfer of 47th Battery, Royal Field Artillery and 2nd Battalion Oxfordshire Light Infantry from Ferozepore, where malarial fever had been rampant. Enteric fever gave 2 admissions and 1 death. Neither case had been inoculated with Wright's anti-typhoid vaccine. Ague gave 88 and 249 admissions out of a yearly total of 451 in November and December; these cases occurred among men from Ferozepore, and the type was very severe. Karachi is situated on the sea coast 490 miles north of Bombay; the climate generally is pleasant, but, during the summer, some months are very oppressive. Rainfall averaged 6·89 inches during the past five years and only 2·73 inches in 1900. The water supply is from two wells on right bank of "Malir" river about 16 miles from Karachi, carried by a covered-in conduit to a reservoir, and thence distributed by pipes; pressure of water is at times insufficient to carry water to upper storey of barracks and houses. The Napier Barracks occupied by British Infantry are good; those occupied by Royal Artillery inferior. Some latrines required ventilation, and this was carried out. In some of the married quarters the cookhouses and latrines are actually under the same roof. Here again the necessity for "automatic earth-boxes" was very evident, as the boxes were too small to contain a sufficient quantity of earth, and the scoops were too large for the boxes; this will be remedied as soon as possible. New urinals have been erected on the trough system, running into an outside receptacle; these are a great improvement. Kitchens generally were badly fitted up, and great improvements are required to bring them up to the standard of a model kitchen. Estimates have been submitted with a view to making some improvements. Some of the Royal Artillery barracks are being remodelled, walls raised to 18 feet, clere-story windows inserted, verandahs being put in, and windows opened out to ground level. Ventilating openings have been made in latrines at ground level, with much benefit. Urinals of a new type have been put up. Suggestions have been made for improving the "wet" canteen by opening the windows down to the ground, and converting them into doorways. Recommendations have been made for re-arranging the rooms of the sergeants' mess and enlarging available space by knocking down wooden partitions and putting in archways, removing iron bars from windows, and converting some windows into doorways. Estimates have been submitted. The kitchens at the garrison cells are small and insufficient. The work shed is small and useless, and no sort of protection from the sun; this will be attended to. The cells have an earth floor, which crumbles up into dust. It is understood that half of them are to be provided with concrete floor this year, and the other half later on. The station family hospital was closed for extensive alterations in July, 1899, and a single-storey building, adjoining the hospital, and standing in its own compound, was occupied and is still so appropriated, as the alterations in the old hospital have not been completed. The assistant-surgeon's latrine is under the same roof as his kitchen, a most objectionable arrangement. The kitchens are badly

furnished in every way, and steps will be taken to improve matters. The milk room is very unsuitable in every way ; its employment as a milk room has been discontinued. A special ward has been set apart for the treatment of enteric cases. The infectious wards are very indifferent and very hot. Steps will be taken to improve them. One of the mortuaries, which was too near the hospital, has been closed.

Ghizri Sanitarium.—Situated about four miles from Karachi on bare sand hills, which once, it is understood, bordered the sea, but from which the sea has now receded for some distance. The situation is bracing and healthy, but the trouble is the drifting sand, which threatens to bury all barrack buildings and requires a large annual sum for its removal. It is still under consideration to abandon this station and build additional barracks, &c., at Manora. Barrack and subsidiary buildings are well looked after and suitable. The latrines require some more ventilation. The latrines and cookhouses of the staff sergeants' quarters are under the same roof.

Hyderabad.—The general health has been fair. Annual strength 441 ; admissions 552 ; deaths 4. Malarial fevers have been prevalent, 184 admissions as compared with 75 in 1899 ; this is ascribed to a heavy rainfall. There has been no enteric fever. There is nothing special to note about the barracks and subsidiary buildings, except that some ventilating openings have been made in latrines, and some minor improvements carried out. Some of the smaller kitchens are unprovided with flues, and the smoke finds its way out wherever it can ; some kitchens are situated too near to latrines, and transmission of disease by flies is highly probable. The water supply is from the Indus, supplied by the Hyderabad Municipality ; it is largely charged with mud in suspension, and has to be cleared with alum. The water seems to be taken from near the river bank, and not far out as it should be ; no special, or indeed any, precautions seem to be taken to guard the water from pollution. "Shah Kadim Reservoir"—a storage tank—is uncovered, and as it is 10 feet below the level of two main roads, dust is blown in, in large quantities ; the tank is cleaned out once in six months. The whole system of distribution, storage, &c., seems to be very unsatisfactory and is being inquired into ; taps are not sufficiently numerous, and water is not laid on in the kitchens, bakery or slaughter-house ; water is not boiled before use. There is a notable absence of water in the cantonment generally for garden purposes, and perhaps to this absence may be ascribed the general healthiness of the station, though it looks barren, bare and uninviting to a degree.

ADEN DISTRICT.—*Aden.* Plague was prevalent from March to June among the civil population. One soldier died, and there were 38 deaths among followers. There were 845 cases of malarial fevers (ague 824, remittent fever 21)—all the troops in garrison were, so to speak, malaria-stricken—and several cases are ascribed to heavy rainfall in February, making the Isthmus more than ordinarily unhealthy. This position was abandoned later on with marked benefit to the health of the troops. There were six admissions for enteric fever and five deaths. There were three cases of multiple neuritis and two cases of incomplete paralysis, possibly due to arsenic in beer ; this was sent for analysis, but result is not stated. Many sanitary improvements in connection with the kitchens have been completed and are still being carried out ; the new pattern cookhouses are too small and cramped, and should have a verandah. The allowance of aqueduct water from Shaik Othman for the lavatories—viz., two gallons per head per diem—is very little. A new swimming bath has been erected at Steamer Point which is much used. There has been some deficiency as regards seat accommodation in the latrines, but this is being increased. Drinking water is distilled from sea water and washing water brought in, in an aqueduct, from Shaik Othman. The hospital accommodation at the Crater is unsuitable, the accommodation at Steamer Point insufficient. A scheme has been proposed to erect a new hospital on Telegraph Hill; if this is not done some additional accommodation should be provided at the present station hospital at Steamer Point. The Ordnance married quarters are bad, but their improvement is under consideration. A new cookhouse is very much needed at the garrison cells

XVI.—ON THE HEALTH OF THE TROOPS SERVING IN EGYPT AND CYPRUS.

I. British Troops.

Sickness and Mortality.

Egypt and Cyprus.

The average strength of British troops serving in the Command during the year, exclusive of those attached to the Egyptian Army, was 3,767 warrant officers and non-commissioned officers and men, of whom 3,655 were stationed in Egypt and 112 in Cyprus. The force was less in Egypt by 304, and greater in Cyprus by 2, than in 1899.

The troops in Egypt throughtout the year comprised the 11th Hussars, the 56th Battery, Royal Field Artillery, No. 16 Company, Eastern Division, Royal Garrison Artillery, a Company of the Royal Engineers, 1st Battalion Seaforth Highlanders, Mounted Infantry and detachments of the Army Service Corps, Royal Army Medical Corps, Army Ordnance Corps, Army Pay Corps, Military Police and General Staff.

The corps which arrived during the year were the 2nd Battalion Leicester Regiment in February, and the 3rd Battalion Seaforth Highlanders in March, both from the United Kingdom. The 2nd Battalion Royal West Kent Regiment left for England in February, and the 1st Battalion Cameron Highlanders proceeded to South Africa for active service in March.

The force in Cyprus consisted of a detachment of the 3rd Battalion Lancashire Fusiliers which rejoined its headquarters in Malta, on being relieved by a detachment of 2nd Battalion Loyal North Lancashire Regiment from that station, in September. A few men of the Royal Engineers and other corps also occupied the station during the year.

Two detachments were stationed at Khartum during the year. A detachment of the 1st Battalion Seaforth Highlanders occupied the station up till April, and a detachment of the 2nd Battalion Leicester Regiment left Alexandria for Khartum in December.

The Principal Medical Officer states in his report "that the general health of the troops was good, and bears a satisfactory comparison with the previous year."

In the following table the admission, mortality, and invaliding rates, &c., for the whole of the troops in the Command are shown, as well as those for Egypt and Cyprus separately :—

1900.	Average Strength.	Admissions.	Deaths.			Invalids.	
			In the Command.	Of Invalids.	Total.	Sent Home.	Finally Discharged.
Egypt	3,655	2,848	25	1	26	68	30
Cyprus	112	86	--	—	—		
Command	3,767	2,934	25	1	26	68	30

(*continued.*) *Egypt and Cyprus.*

1900.	Constantly Sick.	Ratios per 1,000 of Strength.				
		Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
Egypt	171·44	779·2	7·11	18·05	7·96	46·91
Cyprus	3·11	767·9	—			27·77
Command	174·55	778·9	6·90	18·05	7·96	46·84

The admission and constantly sick ratios for the whole Command are higher than in 1899 by 82·5 and ·45 per 1,000, but lower than the average ratios for the ten years 1890–99 by 186·9 and 18·98 per 1,000 respectively, while the mortality rate is lower in both these comparisons by 3·46 and 6·34 respectively. The average sick time to each soldier was 16·91 days, which is longer than in the previous year by ·16 of a day, but shorter than the decennial average period by 6·93 days. The average duration of each case of sickness, 21·71 days, is shorter than in 1899 by 2·34 days, and than the average period by 2·98 days.

Taking Egypt alone, the admission and constantly sick ratios have increased by 90·5 and ·85 respectively, while the death rate has decreased by 3·02 per 1,000, as compared with 1899, and in comparison with the decennial average ratios have decreased by 210·8, 7·53, and 6·80 respectively. The average sick time to each soldier was 17·12 days, which is longer than in the previous year by ·31 of a day, but shorter than the decennial average period by 7·53 days. The average duration of each case of sickness, 21·97 days, is shorter than in the previous year and than the average period for the preceding ten years by 2·44 and 2·93 days respectively.

The health statistics of the stations in Egypt occupied by British troops are given below :—

Stations.	Average Strength.	Admissions.	Deaths.	Ratio per 1,000.	
				Admissions.	Deaths.
Cairo	2,604	1,944	9	746·5	3·46
Alexandria	947	834	12	880·7	12·67
Khartum	104	70	4	673·1	38·46

For the fourth year in succession the admission and mortality ratios were higher for Alexandria than for Cairo. Comparing these ratios in each station with those for 1899, it is found that the admission rate has increased in Cairo by 95·9 and in Alexandria by 32·8, while the death rate has decreased at both stations, in Cairo by 4·32, and in Alexandria by 3·98 per 1,000. The admission rate at Khartum was the lowest and the death rate there was the highest, but the station was not continuously occupied during the year by British troops.

The admission ratio for the garrison of Cyprus is lower than in 1899 by 195·7 per 1,000, but higher than the average ratio for the ten years 1890–99 by 94·6, and the constantly sick ratio is lower in both these comparisons by 11·86 and 10·62 respectively. No death occurred during the year. The

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average sick time to each soldier, 10·14 days, is shorter than in 1899 by 4·32 days, and than the average period by 3·67 days. The average duration of each case of sickness was 13·20 days, which is shorter than in the previous year by 1·81 days, and than the average period by 7·61 days.

In Abstract XXIX is a table showing these statistics for the various regiments and corps which served in the Command during the year.

In the Cavalry, the admission mortality and constantly sick rates were 672·3, 4·26, and 39·64 per 1,000 respectively, as compared with 760·9, 6·52, and 50·04 in 1899. In the Artillery these rates were 713·9, 8·67, and 45·49 per 1,000, as compared with 727·6, 6·41, and 50·80 in the previous year. For the Engineers the rates were 294·7, *nil*, and 16·95, showing a decrease in each instance as compared with 1899, and for the Infantry the rates were 868·5, 8·80, and 54·13, showing an increase of 129·7 in the admission rate, a decrease of ·98 in the death rate, and an increase of 5·43 in the constantly sick rate as compared with the previous year.

Taking separate corps, and excluding those whose average annual strength was under 100 men, the highest admission rate was 1,036·4 per 1,000, in the Mounted Infantry, followed by 932·6 per 1,000 in the 2nd Battalion Leicester Regiment, and 868·8 per 1,000 in the 56th Battery Royal Field Artillery.

The lowest admission ratio was 580·6 per 1,000, in No. 16 Company Eastern Division, Royal Garrison Artillery, the next lowest being 611·1 per 1,000 in the 1st Battalion Cameron Highlanders.

Mortality was highest, 30·53 per 1,000, in the 2nd Battalion Royal West Kent Regiment, which only served for a few weeks at Alexandria in the early part of the year, prior to embarkation for England. The lowest death rates were 2·32 and 3·32 per 1,000 in the 1st and 3rd Battalions Seaforth Highlanders respectively, and in the Mounted Infantry no death occurred. The highest constantly sick rate was 67·09 per 1,000 in the 2nd Battalion Leicester Regiment, the next highest being 58·50 per 1,000 in the 56th Battery, Royal Field Artillery. The lowest ratio was 34·30 per 1,000 in No. 16 Company, Eastern Division, Royal Garrison Artillery, the next lowest being 39·64 per 1,000 in the 11th Hussars.

The sickness and mortality among the troops, arranged according to the ages of the men, are shown in the following table :—

Ages.	Average Strength.	Admissions.	Deaths in Command.	Invalids.	Ratio per 1,000.		
					Admissions.	Deaths.	Invaliding.
Under 20 years ..	529	628	1	9	1,187·1	1·89	17·01
From 20 to 25 years ..	1,384	1,386	10	21	1,001·4	7·23	15·17
„ 25 „ 30 „ ..	1,324	694	8	27	524·2	6·04	20·39
„ 30 „ 35 „ ..	372	164	5	4	440·9	13·44	10·75
„ 35 „ 40 „ ..	120	50	1	6	416·7	8·33	50·00
Over 40 years ..	38	12	—	1	315·8	—	26·32
Total ..	3,767	2,934	25	68	778·9	6·64	18·06

It will be observed that the highest admission ratio was among men under 20 years, and the ratios in the succeeding age periods declined without any interruption. In 1899 the highest was among men between 20 and 25 years of age, and with the exception of men over 40 years of age, the ratios declined in regular sequence.

With regard to the influence of service in the Command on sickness and mortality amongst the troops, the following table has been compiled :—

Length of Service in Command.	Average Strength.	Admissions.	Deaths in Command.	Invalids.	Ratio per 1,000.		
					Admissions.	Deaths.	Invaliding.
Under 1 year ..	2,346	2,162	19	48	921·6	8·10	20·46
From 1 to 2 years..	562	319	3	4	567·6	5·34	7·12
„ 2 „ 3 „ ..	638	374	2	11	586·2	3·13	17·24
„ 3 „ 4 „ ..	64	29	—	3	453·1	—	46·88
„ 4 „ 5 „ ..	37	9	—	—	243·2	—	—
„ 5 „ 10 „ ..	117	41	1	2	350·4	8·55	17·09
Over 10 years ..	3	—	—	—	—	—	—
Total ..	3,767	2,934	25	68	778·9	6·64	18·05

It will be seen that the highest admission rate was among men in their first year, and the next highest among men in their third year of service in the Command; men in their second year of service came next, followed by men in their fourth year, the ratios for the succeeding periods of service showing a steady decline.

There were no admissions among the 3 men who had been more than 10 years in residence. In 1899 the highest admission rate was among men in their third year and the next highest among men in their first year of service, in the Command, the ratios for the succeeding periods of service showing a decline in the same sequence as in the year under report.

In Abstract XXV is a table showing the principal statistics of sickness and mortality arranged according to the different sections of disease.

General Diseases.—There were 3 cases of *small-pox* during the year, as compared with 2 in 1899, *nil* in 1898, and 3 in 1897. The ratio, ·8 per 1,000, is higher than in the previous year by ·3, and than in the ten years' average by ·4. All the cases occurred at Cairo, but in no instance could any definite origin be traced, although one case was contracted at the citadel during the time that there were small-pox cases among the women. For *other eruptive fevers* there were 52 admissions, equal to a ratio of 13·8 per 1,000, as compared with 1·3 in 1899, and with 1·6, the ten years' average rate.

The cases comprised, 3 for cow-pox, 1 for chicken-pox, 18 for measles, and 30 for scarlet fever. All the cases of measles occurred at Cairo, and of the 30 cases of scarlet fever, 25 occurred at Cairo and the remainder at Alexandria, where the disease was prevalent among the civil population. At Cairo one case occurred at Abbassiyeh in June; the remainder occurred in the Citadel Barracks during the month of November, the first case being admitted on the 8th, and the last on the 24th days of that month. The infected troops were put under canvas in the Citadel, at first, but later all the infantry, with the exception of two companies, were moved into Camp at the Polygon. The Principal Medical Officer in his remarks states that "the cause of this epidemic cannot be definitely stated, but it seems likely that it was due to infection sent in clothing, etc, to the 3rd Battalion Seaforth Highlanders, from parts of Scotland where the disease was said to be rife." He further remarks that "arrangements were made for all parcels coming from Scotland to be disinfected at Abbassiyeh before being given to the troops."

There were 425 admissions for *influenza*, equal to a ratio of 112·8 per 1,000. Of the total number of cases 405 were admitted at Cairo, and during the months of July, August, and September, at which time the disease was epidemic at that station, 324 admissions were recorded. There were 2 admissions for *diphtheria* as compared with one in the previous year. Both cases occurred at Cairo.

Enteric Fever caused 69 admissions, or a ratio of 18·3 per 1,000, which is higher than in 1899 by 10·7, but lower than the decennial average rate by 6·9. The deaths numbered 11, giving a ratio of 2·92 per 1,000, as compared with 1·77 in the preceding year and 6·28, the decennial average rate. The per-

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centage of mortality to attack was 15·9, as compared with 23·3 in 1899 and 24·9, the average percentage for the ten years 1890–99. Of the cases 59 were admitted at Alexandria, 7 at Cairo, and 2 at Khartum and 1 in Cyprus. The ratio of constantly sick was 2·43 per 1,000, as compared with 2·45 the previous year and 4·32, the decennial average rate.

The relative sickness and mortality from enteric fever in Cairo and Alexandria were as follows :—

Stations.	Average Strength.	Admissions.	Deaths.	Ratio per 1,000.	
				Admissions.	Deaths.
Cairo	2,604	7	2	2·7	·77
Alexandria	947	59	7	62·3	7·39
Total	3,551	66	9	18·6	2·53

For the third year in succession Alexandria furnished the highest admission and mortality rate; prior to that Cairo had furnished the highest rates under both headings, for a similar period. Of the cases at Cairo, 3 occurred at Abbassiyeh, 2 at Kasr-el-Nil, 1 in the Citadel Barracks and 1 from Abdin Barracks. One of the cases is stated to have been probably contracted at Khartum, but in the other cases the probable cause is not assigned. At Alexandria the cases were distributed between Mustapha (41), town of Alexandria (2), Ras-el-tin Barracks (2), Station Hospital (1) and Aboukir Camp (12). Commenting on the cases at Alexandria, the Senior Medical Officer remarks that from the commencement of the rise of the Nile until the end of the year a very grave epidemic of enteric fever broke out in the City and suburbs of Alexandria. As far as could be ascertained there were 143 cases and 24 deaths among the European civil population. He further remarks that "the Greek and English communities would appear to have been the greatest sufferers, but this may be due to the fact, and most probably is, that these races consume more water than the other nationalities, who are peculiarly wine drinkers." The outbreak of the epidemic was attributed to the condition of the water supply, which is obtained from the Mahmoudieh canal, an artificial branch of the Nile. The water in the canal is contaminated by various agencies, but is filtered before being distributed.

The following table shows the enteric fever admissions and deaths in Egypt according to age and length of service in the Command :—

Age.	Average Strength.	Admissions.	Deaths.	Ratio per 1,000.	
				Admissions.	Deaths.
Under 20 years	515	8	—	15·5	—
From 20 to 25 years ..	1,327	30	5	22·6	3·77
„ 25 „ 30 „ ..	1,295	16	1	12·4	·77
„ 30 „ 35 „ ..	363	12	4	33·1	11·02
„ 35 „ 40 „ ..	118	1	1	8·5	8·47
Over 40 years	37	1	—	27·0	—
Total	3,655	68	11	18·6	3·01

Length of Service in Command.	Average Strength.	Admissions.	Deaths.	Ratio per 1,000.	
				Admissions.	Deaths.
Under 1 year	2,246	59	8	26·3	3·56
From 1 to 2 years ..	560	2	1	3·6	1·79
„ 2 „ 3 „ ..	634	5	2	7·9	3·15
„ 3 „ 4 „ ..	62	—	—	—	—
„ 4 „ 5 „ ..	85	—	—	—	—
„ 5 „ 10 „ ..	115	2	—	17·4	—
Over 10 years	3	—	—	—	—
Total	3,655	68	11	18·6	3·01

As in the previous year, inoculation with anti-typhoid material was carried out to a large extent, the total number of inoculations being 720. Only one of these contracted enteric fever. The patient was inoculated on the 8th December, 1899, and admitted to hospital on the 9th January, 1900, one month afterwards. The case was severe, with several complications, and terminated fatally, after an illness of over three months.

Other Continued Fevers caused 188 admissions, comprising 179 for simple continued and 9 for Mediterranean fever. The admission ratio, 49·9 per 1,000, is lower than the previous year's rate and that of the decennial average by 3·6 and 38·7 per 1,000 respectively. One fatal case of simple continued fever occurred at Khartum. Of the cases of Mediterranean fever, 5 took place at Cairo, 3 at Alexandria, and 1 at Cyprus, and of the cases of simple continued fever, Cairo contributed 119, Alexandria 31, Khartum 27, and Cyprus 2.

Dysentery caused 59 admissions and 1 death, Cairo contributing 30 cases, Alexandria 28, and Khartum 1. The death occurred at Wady Halfa, the patient having been left there while the detachment to which he belonged was on the way to Khartum. The admission ratio equalled 15·7 and the death rate ·27 per 1,000, which are lower than the previous year's rates by 3·0 and ·49, and than the decennial average rates by 3·9 and ·56 per 1,000 respectively.

Malarial Fevers accounted for 32 admissions, or a ratio of 8·5 per 1,000, which is below the previous year's rate by 9·2, and that of the average rate for the preceding ten years by 18·6. All the cases were returned as ague.

Septic Diseases were represented by a single case of erysipelas, which occurred at Cairo, in a man who was under treatment for a wound in hospital.

Tubercular Diseases gave 10 admissions and 1 death. The admission ratio was 2·7 per 1,000, which is below the rate in the previous year by ·3, and is also fractionally lower (·2) than the ten years' average rate. Seven of the admissions and the death were due to tubercular disease of the lung, and in the remainder the joints were the part affected.

*Venereal Diseases.**—There were 32 admissions for *primary syphilis*, equal to a ratio of 8·5 per 1,000, which is below the rate for 1899 by 26·9 and the decennial average rate by 39·3. The number of men constantly sick was 3·25, the equivalent ratio being ·86 per 1,000, as compared with 4·10 in the previous year, and 4·43, the decennial average rate. If to this be added the sickness from soft chancre, for which there were 251 admissions and 21·16 men constantly sick, the total admission ratio for primary venereal sores equalled 75·1 per 1,000 and that of constant inefficiency 6·48, both being lower than the corresponding ratios in the preceding year by 25·7 and 3·05, and than the decennial average rates by 68·4 and 5·16 respectively. *Secondary Syphilis*, with 48 admissions and 4·33 men constantly sick,

* See also Appendix No. VI, p. 476.

ave ratios of 12·7 and 1·15 per 1,000. The admission rate is lower than n 1899 by 18·1 and than the decennial average rate by 35·0, while the constantly sick rate is lower in the two comparisons by 1·82 and 3·63 respectively. *Gonorrhœa* was the cause of 403 admissions, equal to a ratio of 107·0 per 1,000, showing an increase of 24·2 as compared with the previous year's rate, but a decrease of 3·5 in comparison with the decennial average rate. The ratio of constantly sick, 7·61 per 1,000, is also higher in the former comparison by 1·67 and lower in the latter by ·24.

Including all forms, the total admission rate for venereal diseases was 194·8 per 1,000, which is lower than the rate in 1899 by 19·6, and than the average rate for the preceding ten years by 106·9. The constantly sick rate, 15·24 per 1,000, is also lower in both these comparisons by 3·20 and 9·03 respectively.*

The following table shows the prevalence of venereal diseases by stations in the Command :—

Station.	Average Strength.	Admissions.	Constantly Sick.	Ratio per 1,000.	
				Admissions.	Constantly Sick.
Cairo	2,604	400	32·73	153·6	12·57
Alexandria	947	302	22·95	318·9	24·23
Khartum	104	15	·81	144·2	7·79
Cyprus	112	17	·93	151·8	8·30
Total ..	3,767	734	57·42	194·8	15·24

Parasitic Diseases were the cause of 52 admissions, giving a ratio of 13·8 per 1,000, which shows an increase on the ratio for the previous year and that of the decennial average of 3·7 and 4·2 respectively. Scabies 31 cases and phthirius inguinalis 14, were the chief causes of admission.

Alcoholism caused 2 admissions or a ratio of ·5 per 1,000, which compares favourably with 3·0, the rate for the previous year, and with 2·8, the decennial average rate. As was the case in 1899, there was no admission for delirium tremens.

Rheumatism gave 82 admissions, 5 being for rheumatic fever. The ratio 21·8 per 1,000, is higher than the preceding year's ratio by 5·1, but lower than the decennial average rate by 3·8. There was no death.

Debility caused 29 admissions, equal to a ratio of 7·7 per 1,000, and under *other general diseases* there were also 29 admissions recorded, comprising 12 cases each of mumps and non-malignant new growth, 4 of cyst, and 1 of anæmia.

Local Diseases.—*Diseases of the Nervous System* were the cause of 33 admissions, equal to a ratio of 8·8 per 1,000, as compared with 9·4 in 1899, and 10·1, the average rate for the ten years 1890–99. The cases included 14 neuralgia, 7 headache, 4 epilepsy, 3 melancholia, and 1 each degeneration of spinal cord, somnambulism, nervous weakness and mania.

Diseases of the Eye caused 57 admissions, equal to a ratio of 15·1 per 1,000 which is lower, as compared with the previous year's rate and that of th

* There were 4 admissions for ulcer of penis of non-venereal origin, with men constantly sick. If, as in former years (prior to 1897), these cases were inclu with those of primary syphilis and soft chancre under the heading of prim venereal sores, the admission and constantly sick rates for all venereal dise would equal 195·9 and 15·30 respectively.

average for the ten years 1890-99 by 7·4 and 14·4 respectively. 42 of the cases recorded were due to conjunctivitis. *Egypt and Cyprus.*

Diseases of the other Organs of Special Sense were the cause of 81 admissions, all of which, with one exception, were cases of aural affection. The admission ratio, 21·5 per 1,000, is higher than the ratio for 1899 and the ten years' average rate by 12·7 and 7·2 per 1,000 respectively.

Diseases of the Circulatory System caused 28 admissions and 3 deaths, one being that of an invalid who had left the Command. The admission rate equalled 7·4 per 1,000, which is higher than the rate in the previous year by 3·4, and is identical with the average ratio for the preceding ten years. Of the admissions, 16 were for disordered action and 8 for valvular disease of the heart. Two of the deaths (including that of the invalid) were due to valvular disease of the heart and one to aneurysm of aorta.

Diseases of the Respiratory System.—There were 67 admissions under this heading, comprising 24 for bronchial affections, 19 for pneumonia, 15 for pleurisy, 7 for laryngitis and 2 for phthisis. The admissions equalled a ratio of 17·8 per 1,000, which is lower than the rate in 1899 by 3·7, and than the average rate for the preceding ten years by 19·1. There were 3 deaths, all due to pneumonia.

Diseases of the Digestive System caused 259 admissions, or a ratio of 68·7 per 1,000, which shows a decrease, as compared with the rate in the previous year and with the decennial average ratio, of 10·9 and 51·8 respectively. The diseases causing the greater number of the admissions were mouth and throat affections 109, diarrhœa 55, hepatic affections 27, inflammation of the stomach 18, dyspepsia and colic 12 each, piles 11, and hernia 10. One death occurred from abscess of liver, which had been operated on at Cairo, the death rate being ·27 per 1,000, as compared with 1·77 in the previous year, and 1·13 the decennial average rate.

Diseases of the Lymphatic System caused 32 admissions, equal to a ratio of 8·5 per 1,000, which is lower than in 1899 by 5·9 and than the decennial average rate by 8·1. Of the cases 31 were for inflammation of the lymphatic glands and 1 for hypertrophy of spleen.

Diseases of the Urinary System gave 8 admissions, or a ratio of 2·1 per 1,000, as compared with ·8 in 1899, and 1·5 the average rate for the preceding ten years. The cases included 3 of incontinence of urine, 2 each of acute nephritis and albuminuria, and 1 of cystitis.

Diseases of the Generative System caused 310 admissions, equivalent to a ratio of 82·3 per 1,000, which is higher than the previous year's rate by 2·2, but lower than the decennial average ratio by 29·7. There were 251 admissions for soft chancre, which have been previously referred to under the heading of venereal diseases, and among the remainder were 22 cases of balanitis, 19 of orchitis, and 4 each of ulcer of penis, varicocele and hydrocele.

Diseases of the Organs of Locomotion, with 47 admissions, furnished a ratio of 12·5 per 1,000, which is higher than the previous year's and the decennial average rates by 2·7 and 2·6 respectively. Of the admissions, 20 were due to synovitis.

Diseases of the Connective Tissue gave 113 admissions, or a ratio of 30·0 per 1,000, which shows an increase as compared with the ratio in 1899, and with the decennial average rate of 14·4 and 5·0 respectively.

Diseases of the Skin accounted for 133 admissions, or a ratio of 35·3 per 1,000, which shows a decrease as compared with the ratio in the previous year of 12·2 and in comparison with the decennial average rate of 12·3. Of the admissions 55 were due to boils, 20 each to eczema and ulcers, 15 to onychia, and 6 to whitlow.

INJURIES.—There were 238 admissions and 5 deaths, equal to ratios of 63·2 and 1·33 per 1,000, which are lower than in the preceding year by 12·6 and ·69 and than the average rate for the ten years 1890-99, by 24·7 and ·20 respectively.

For *general injuries* there were 4 admissions, viz. :—3 for multiple injury and 1 for sun-stroke. Two of the cases of multiple injury were caused by falling out of the barrack-room window, and in the third case the man fell from a verandah at Kasr-el-Nil barracks, sustaining several fractures of

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bones, and ultimately dying from exhaustion. The case of sun-stroke which occurred at Alexandria, is noted as being of obscure nature.

There were 234 admissions for *local injuries*, including 67 for wounds, 61 for sprains, 53 for contusions, 20 for fractures, and 15 for blisters of feet. Of 4 deaths recorded under this heading one was due to self-inflicted gunshot wound, the court of inquest returning a verdict of "suicide whilst temporarily insane"; one to dislocation of spine with fracture, from a fall out of a barrack-room window; one to fracture of base of skull, the man being run over by a train whilst on patrol; and one to rupture of kidney, caused by a sudden strain when riding.

POISONS.—One case of poisoned wound, the result of injection with anti-typhoid serum, was admitted to hospital, but only required treatment for a few days.

SURGICAL OPERATIONS.—A statement of the principal surgical operations performed during the year is subjoined, following the classification of the nomenclature of diseases:—Operations on cysts (1), removal of foreign bodies (1), operations on the skin and subcutaneous tissue (1), operations on bones (4), amputations (4), excision of eyeball (1), operations on the ear (1), operations on the abdomen (4), operations on the rectum and anus (1), and operations on the generative organs (4). The operations on bones were 1 for contusion, the scar on skin being re-opened and linear osteotomy of tibia performed, and 3 for fracture of jaw; amputations included 3 of toes, and 1 of fingers; the operations on the abdomen were all for abscess of liver; and the operations on the generative organs comprised 1 for phimosis, 1 for paraphimosis (both cases complicated with gonorrhœa), and 2 for soft chancre. Chloroform was the anæsthetic used in 19 instances and chloroform and ether in 3. Of the total number of operations, 17 resulted satisfactorily, 2 were partially successful, and 3 died. The deaths were 1 after operation for abscess of liver, and 2 after operations for fracture of jaw, both cases of multiple injury.

INVALIDING.—There were 68 men invalided home during the year, equal to a ratio of 18·05 per 1,000, which is lower than that for 1899 by 14·53, and than the decennial average rate by 15·27. Cairo furnished 40 and Alexandria 28 of the invalids. The highest invaliding rate for any arm of the service was 23·47 per 1,000 in the Infantry, followed by 19·15 per 1,000 in the Cavalry. The Royal Artillery furnished the lowest ratio under this heading, 5·78 per 1,000, the next lowest being 8·31 per 1,000, in Militia Infantry.

In individual corps with an average strength of not less than 100 men, the highest invaliding ratio was 36·52 per 1,000 in the 2nd Battalion Leicester Regiment, the next highest being 23·81 per 1,000 in the 1st Battalion Cameron Highlanders, followed closely by 22·04 per 1,000 in the 1st Battalion Seaforth Highlanders. In the 2nd Battalion Royal West Kent Regiment, which only served for six weeks in the Command, and in the Mounted Infantry, stationed at Cairo throughout the year, there were no invalids. The lowest invaliding ratio was 5·38 per 1,000 in No. 16 Company, Eastern Division, Royal Garrison Artillery, the next lowest being 6·25 per 1,000 in the 56th Battery, Royal Field Artillery, followed by 8·31 in the 3rd Battalion Seaforth Highlanders. As to the ages of the men invalided,* 9, or 17·01 per 1,000, occurred in men under 20 years of age; 21, or 15·17 per 1,000, in men between 20 and 25 years; 27, or 20·39 per 1,000, in men between 25 and 30; 4, or 10·75 per 1,000, in men between 30 and 35; 6, or 50·00 per 1,000, in men between 35 and 40 years, and 1, or 26·32 per 1,000, in men above 40 years of age. Compared with similar ratios in the previous year, a considerable decrease has occurred in each instance. Taking service in the Command,† 48 men, or 20·46 per 1,000, were in their first year; 4 men, or 7·12 per 1,000, were in their second year; 11, or 17·24 per 1,000, were in their third year; 3, or 46·88 per 1,000, were in their fourth year;

* See table on p. 214. † See table on p. 215.

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and 2 men, or 17·09 per 1,000, had between five and ten years' service in the Command. All these ratios, with one exception, that of men in their fourth year, show a decrease in comparison with those given in the preceding year.

The principal causes of invaliding were :—nervous disorders (including 6 for mental ailments, equal to a ratio of 1·59 per 1,000) 12, or 3·18 per 1,000 ; circulatory diseases 9 (including 6 cases of valvular disease, and 3 of disordered action of the heart) or 2·39 per 1,000 ; diseases of other organs of special sense 7, or 1·86 per 1,000 ; digestive disorders 5, or 1·33 per 1,000 ; and tubercular diseases, diseases of the eye, diseases of organs of locomotion, and local injuries 4 each, or 1·06 per 1,000.

The number of men discharged the service as medically unfit was 30, equal to a ratio of 7·96 per 1,000, which is lower than that for the previous year by 16·04 and than the decennial average rate by 4·22. The chief causes of discharge were :—Diseases of the nervous system 10 cases, or 2·65 per 1,000 (the latter including 6 cases, or 1·59 per 1,000, of mental disorder) ; tubercular diseases 6 cases, or 1·59 per 1,000 ; and diseases of the circulatory system 4 cases (valvular disease 3, and disordered action of heart 1), or 1·06 per 1,000.

Two recruits were inspected for the regular forces during the year and found fit.

Officers.—The average strength was 123, and there were 74 cases of sickness, 2 deaths, and 7 cases of invaliding, the corresponding ratios being 601·6, 16·26 and 56·91 per 1,000, as compared with 507·0, *nil*, and 49·30 respectively in 1899. There were 5 admissions for enteric fever, of which 4 occurred at Alexandria, and 1 at Cairo. The Senior Medical Officer at Alexandria attributes the cases there to the water supply. Two of the officers lived in the suburbs, one in the town, and one had, a week previous to attack, been quartered at Mustapha Barracks. None of these officers had been inoculated against enteric fever. Amongst the remaining admissions were 24 cases of influenza, 12 of local injuries, 11 of digestive disorders, and 5 of simple continued fever. The deaths were due to inflammation of liver and dysentery, the latter being a young officer who had recently arrived from England. The causes of invaliding were enteric fever 5 cases, and 1 each for debility and eczema.

Women.—In an average strength of 196, there were 182 admissions and 1 death, equal to ratios of 928·6 and 5·10 per 1,000 respectively. The admission rate is higher than in the previous year by 5·9, while the death rate is lower by 4·56. The chief causes of admission were :—influenza 24, diarrhœa 16, debility 15, anæmia 10, simple continued fever 9, enteric fever and dysentery 5 each, small-pox 4, and diseases peculiar to women 27. All the cases of small-pox occurred at Cairo, and of the cases of enteric fever, 3 occurred at Alexandria, and 1 each at Cairo and Cyprus. The death was due to eclampsia during child-birth.

Children.—In an average strength of 327, there occurred 368 admissions and 15 deaths, the equivalent ratios being 1,125·4 and 45·87 per 1,000, as compared with 1,013·6 and 46·07 in 1899. The principal causes of illness were :—measles 19 cases, influenza 21, whooping cough 13, simple continued fever 17, enteric fever 6, debility 21, conjunctivitis 122, bronchitis 27, and diarrhœa 33. The deaths were 7 from debility, 3 from immaturity at birth, and 1 each from diphtheria, eclampsia, pneumonia, and inflammation and hæmorrhage of intestines.

Vaccination.—During the year there were 909 re-vaccinations among the men, of whom 697 gave perfect results, 75 modified results, and 137 failures. The large number of vaccinations was due to the arrival of the 3rd Battalion (Militia) Seaforth Highlanders. Amongst the women there were 67 re-vaccinations with 20 failures ; and of 35 primary vaccinations and 30 re-vaccinations among the children, failure resulted in 4 and 10 instances respectively. The lymph used was obtained partly from the Army Vaccine Institute, Aldershot, and partly from the Egyptian Sanitary Department.

II. Royal Malta Artillery.

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A company of the Royal Malta Artillery arrived early in January, and was stationed at Cairo throughout the year. The average annual strength was 133, and there were 125 admissions to hospital and 1 death, the equivalent ratios being 939·8 and 7·52 per 1,000. The average sick time to each soldier was 19·79 days, and the average duration of each case of sickness 21·05 days.

Influenza caused 16 admissions, one of which resulted fatally. Venereal diseases were represented by 41 cases, including 2 cases each of primary and secondary syphilis, 23 of gonorrhœa, and 14 of soft chancre. The other admissions were principally due to local injuries 17 cases, digestive disorders 10, diseases of the eye and rheumatism 9 cases each, and simple continued fever 5 cases.

There was an average strength of 5 officers present, and 5 cases of sickness are recorded, 2 being due to rheumatism, and one each to influenza, simple continued fever, and synovitis.

In an average annual strength of 12, there were 3 admissions among the women, while among the children, with an average strength of 18, there are 18 admissions recorded, 10 of which were due to conjunctivitis, and 1 death, due to debility.

Twenty-one recruits presented themselves for inspection, and 10 were found fit. Of the 11 rejected 7 were on account of defective vision, and of the men found fit only one was unable to read. There were 6 vaccinations among the recruits, and 4 soldiers, other than recruits were re-vaccinated.

Sanitary Conditions.

The Principal Medical Officer (Colonel W. J. Fawcett, M.B., R.A.M.C.) reports that the general health of the troops was good and bears a satisfactory comparison with the previous year. He notes the following principal points in connection with the sanitary reports from the various stations in the Command.

In the *Citadel Barracks, Cairo*, the work of replacing the old wooden structures of the latrines with new brickwork still continues.

At *Kasr-el-Nil*, owing to the unusual strength, some overcrowding took place, and arrangements were made for companies undergoing field training to be placed under canvas.

Abbassiyeh.—The site of the intake of the water supply is objectionable, as it is situated down stream from Old Cairo, and is very liable to pollution. Filtered water has been laid on to the Main Barracks. The floors in several rooms of these barracks, used as married quarters, have been renewed with asphalte. The new married quarters referred to in last year's report are now in course of erection. New sashes were provided to the chapel school and some of the barrack rooms, much improving the ventilation. The drainage in several of the stables was remodelled; the old Egyptian masonry drain under the centre of the stables was filled up and new drains of glazed stone-ware pipes laid down.

Station Hospital, Cairo.—New pattern windows and jalousies were placed in various wards; four new fixed baths, with hot and cold water were added, and the isolation division was connected with the duty-room by electric bells.

Alexandria.—The Principal Medical Officer remarks that "the most important sanitary question is the occurrence of an epidemic of enteric fever at Alexandria." The disease was attributed to the water supply, and the matter was brought forward in the strongest possible way, with the result that larger filtering beds and an intake from a better source will be provided. The removal of the bulk of the Alexandria garrison to a camp, with a safe water supply during the autumn months, is also contemplated.

Egypt and Cyprus.

At *Mustapha Barracks* a complete system of drainage is in course of construction, and the latrines, ablution rooms, and cookhouses will then be drained into the sea. Arrangements to move the stores and troops now in the *Red Barracks* to Mustapha Barracks are making satisfactory progress. At the *Station Hospital, Ras-el-Tin*, a new ablution room is in course of construction close to the kitchen, from which a supply of hot water will be laid on for baths, &c. A second officer's ward was formed during the year by partitioning off a portion of one of the men's wards. Water closets which will drain into the sea are being built at the west end of the hospital.

Khartum was again used, during a portion of the year, as a station for British troops. The barrack accommodation, which consists of mud huts supplemented by Indian pattern tents, is noted as being insufficient. The huts have no verandahs, and are not raised off the ground, and as they absorb heat during the day they become so hot and stuffy at night as to render them uninhabitable, the troops as a consequence having to sleep outside. To obviate this, new barracks are being constructed. The water supply is obtained from the Blue Nile in mid-stream, and regimental police are stationed on the banks to prevent pollution, but as the river is navigable there is a large traffic in native boats, and it is also liable to pollution from the many villages situated on the bank of the river higher up than Khartum. During the rainy season too, much refuse is washed off the land into the river. All the water is filtered and stored for use, but the distance of the barracks from the river causes much difficulty in the transport. Equipment for a station hospital of twenty-five beds has been sent from Cairo.

Cyprus.—At Polymedia it is intended to replace the earthenware pipes in the water conduit by iron ones, as the former are liable to be broken by shepherds in order to water their flocks, entailing the pollution of the supply. At Troodos the watershed is to be cleared of all inhabited dwellings which have been erected on that area. During the year a well built stone latrine was erected at the camp, and a similar building at the station hospital, which was also provided with an ablution and bath room.

XVII.—ON THE HEALTH OF THE TROOPS ON BOARD SI

Troops on Board Ship.

The troops embarked during the year, as shown by the returns receive headquarters, were :—

I. Troops proceeding on service abroad - - -	113,61
II. Troops returning from abroad - - - -	9,08
III. Troops proceeding from one station abroad to another	10,01
IV. Invalids returning to England (other than those from the South African Field Force) - - -	2,16

I.—Troops Proceeding on Service Abroad.

The total number of warrant officers, non-commissioned officers and embarked for foreign service during the year was 113,619, the equiva annual strength being 7,001. There were 9,795 admissions into hospital 104 deaths, being in the annual ratios of 1399·1 and 14·85 per 1,000 res tively.

The admission rate is higher than the corresponding ratio for 1899 by 60 and than the average rate for the previous ten years by 413·8, and the de rate is also higher by 8·38 in the former comparison and by 10·31 in latter.

The admissions and deaths, arranged according to the different section disease, are shown in Abstract XXVI.

General Diseases.—There were 14 admissions for *eruptive fevers* 6 be due to scarlet fever, 6 to measles, and 1 each to chicken-pox and cow-p and influenza caused 712 admissions.

Enteric fever caused 18 admissions and 5 deaths. Seventeen of the ca occurred among troops *en route* to South Africa, and in the majority of th cases the disease is stated to have been contracted prior to embarkati The remaining case occurred on the s.s. "Britannic" on the voyage Australia in November, and although the disease was believed to have b contracted on board, the cause could not be definitely assigned.

For *other continued fevers* there were 159 admissions, or a ratio of 22·7 1,000, which is higher than in the preceding year by 11·4. *Dysentery* cau 14 admissions, as compared with 4 in the previous year. Of 101 admissi under the head of *malarial fevers*, 96 were due to ague and 5 to remitt fever, one of which resulted fatally. Under *septic diseases* 10 admissions erysipelas are recorded and *tubercular diseases* caused 10 admissions, co prising 5 for general tubercle and 5 for tubercle of the lungs. There w 2 deaths from tubercle of the lungs.

Venereal Diseases.—For *primary syphilis* there were 135 admissions, o ratio of 19·3 per 1,000, which is below that for 1899 by 45·2. If to these added 179 cases of soft chancre, the ratio for primary venereal sores equ 44·9, which is below the previous year's rate by 51·3. *Secondary syphi* with 142 admissions, gave a ratio of 20·3 per 1,000, which is below that

* These figures do not represent all the details, inasmuch as returns were received in connection with the voyages of many of the vessels.

the previous year by 8·8. *Gonorrhœa* caused 765 admissions, equal to a ratio of 109·3 per 1,000, which is lower than in 1899 by 67·6. Including all forms of venereal diseases, the total admissions equalled 174·5 per 1,000, as compared with 302·2 in 1899. *Troops on Board Ship.*

Parasitic Diseases caused 234 admissions, 161 being for scabies, 42 for ringworm, 25 for phthirius inguinalis, 5 for pediculus, and 1 for tænia solium, the ratio per 1,000 being 33·4. *Alcoholism* caused 25 admissions, 11 of which which were returned as delirium tremens. *Rheumatism* caused 306 admissions, including 34 for rheumatic fever and 8 for gout, the ratio, 43·7 per 1,000, being higher than the previous year's rate by 19·9. There was 1 death from rheumatic fever. *Debility* caused 147 admissions, or a ratio of 21·0 per 1,000, and *other general diseases* were represented by 22 cases of anæmia, 8 of mumps, 8 non-malignant new growth, 3 purpura, 1 cyst, and 1 malignant new growth.

Local Diseases.—*Diseases of the Nervous System* caused 193 admissions, the equivalent ratio being 27·6 per 1,000, as compared with 2·6 in 1899. Of the cases, 136 are shown as neuralgia, and 19 as epilepsy. Four deaths occurred, 3 from meningitis, and 1 from epilepsy.

Diseases of the Eye, with 147 admissions, of which 127 were for conjunctivitis, gave a ratio of 21·0, which is higher than the previous year's rate by 10·4. There were 136 admissions for *diseases of other organs of special sense*, 127 being aural affections, and 9 diseases of the nose, equal to a ratio of 19·4 per 1,000, which is higher than in the previous year by 14·8. For *diseases of the circulatory system* there were 46 admissions, the ratio being 6·6 per 1,000, as compared with 2·6 in 1899. The cases comprised 19 of disordered action of heart, 11 of varix, 8 of valvular disease of the heart, 3 of syncope, 2 of aneurysm, and 1 each of degeneration of heart, dilatation of heart, and thrombosis. There were 2 deaths, 1 each from syncope and fatty degeneration of heart. *Diseases of the Respiratory System* caused 1,495 admissions and 78 deaths, the admission ratio, 213·5 per 1,000, being above that for the previous year by 143·7. The principal diseases were bronchial affections 877, pneumonia 405, laryngitis 112, and pleurisy 81. Of the deaths, 77 were from pneumonia, the remaining one being from bronchitis. The incidence of diseases of the respiratory system amongst troops embarking for South Africa, among whom the great majority of the admissions occurred, was marked, and in many cases was attributed to the prevalence of influenza at the time of embarkation. Exposure to cold prior to embarkation was also noticed as a possible cause. Forty-four admissions from pneumonia, with 7 deaths, occurred on s.s. "Cymric" on the voyage to South Africa, in connection with which the officer in medical charge remarked "that it would appear that this was no ordinary outbreak of pneumonia, but an infectious form, the cause of which was influenza, probably imported from Aldershot, where it was rife."

Diseases of the Digestive System caused 3,043 admissions and 4 deaths, the admission ratio, 434·7, being higher than the previous year's rate by 346·1. Affections of the mouth and throat caused 1,547 admissions, and dyspepsia, diarrhœa, constipation, and colic contributed the greater number of the remaining cases. The deaths were due to enteritis 2, and inflammation of stomach and peritonitis 1 each. Bad ventilation and proximity to horse stables are noted as being exciting causes of affections of the throat.

Diseases of the Lymphatic System caused 35 admissions, the ratio, 5·0 per 1,000, being lower than in 1899 by 3·8. For *diseases of the urinary system* there were 19 admissions and 1 death. The cases comprised 9 of cystitis, 4 of Bright's disease, 2 each of acute nephritis and irritability of bladder, and 1 case each of hæmaturia and retention of urine. The death was due to Bright's disease. *Diseases of the Generative System* caused 295 admissions, equal to a ratio of 42·1 per 1,000, as compared with 53·9 in 1899. Soft chancre (already referred to under venereal diseases), balanitis, and orchitis were the chief causes of admission. *Diseases of the Organs of Locomotion* caused 114 admissions, the ratio, 16·3 per 1,000, being higher by 11·0 than in the previous year. Synovitis, 52 cases, and myalgia, 39 cases, furnished the chief cause of admission. *Diseases of the Connective Tissue* caused 158 admissions, the ratio, 22·6 per 1,000, being lower by 7·0 than in 1899. For *diseases of the skin* there were 517 admissions, including 160 for boil, 146 for ulcers,

Troops on Board Ship.

99 for eczema, and 36 for whitlows, the ratio being 73·8 per 1,000, as c pared with 56·0 in 1899, and 77·3 in 1898.

INJURIES.—There were 742 admissions and 6 deaths, the admission being 106·0 per 1,000, which is higher than that for 1899 by 43·3.

For *general injuries* there were 54 admissions, viz., 29 for sun-stroke, 18 heat-apoplexy, 5 for burns and scalds, and 2 for heat-stroke.

All the cases of sun-stroke, heat-apoplexy, and heat-stroke occurred am troops proceeding to South Africa. 6 deaths are recorded, 4 from h apoplexy, and 2 from suffocation from submersion (both suicidal).

Courts of inquiry were held on the cases of suicide, but no motive coul assigned.

There were 688 admissions for *local injuries*, mostly due to wounds, spra and contusions.

POISONS.—1 case of ptomaine poisoning and 1 of poisoned wound recorded under this heading.

OFFICERS.—The number of officers embarked was 3,743, among whom cases of sickness occurred. There were 3 deaths, viz., 1 each from rheum fever, meningitis, and pneumonia.

WOMEN AND CHILDREN.—164 women and 188 children embarked, am whom there were no casualties.

II.—TROOPS RETURNING HOME FROM ABROAD.

The number of effective warrant officers, non-commissioned officers men who embarked for England was 9,087, the equivalent annual stren being 693. The admissions into hospital numbered 616, and there we deaths, equal to ratios of 888·9 and 11·54 per 1,000.

The admission rate is higher than in 1899 by 175·4, but lower than average rate for the preceding ten years by 218·6. The death rate is hig by 7·33 in the former comparison and by ·72 in the latter.

The admissions and deaths, arranged according to the various section dis-ase, are shown in Abstract XXVI.

GENERAL DISEASES.—*Eruptive Fevers.* A mild case of *small-pox* occurred transport s.s. "Jelunga." The patient was landed at Port Said for treatm in the civil hospital there, and it is stated that the case came from Mo Lavinia, Colombo, where the disease is reported to have been prevalent n to camp.* One case of *measles* occurred on transport s.s. "Avondale Cast among troops returning from South Africa. *Influenza* caused 6 admissic There were 23 admissions and 6 deaths from *enteric fever;* 16 of the adn sions and 5 deaths occurred among men of the City Imperial Volunt Corps returning from South Africa on the transport s.s. "Aurania" dur the month of October. The cause of the outbreak is attributed to the c dition of the water in and around Pretoria, although the men are said have been constantly warned against using this water. The remaining ca occurred as follows:—2 on transport s.s. "Avondale Castle," 2 on transp s.s. "Algeria," 1 of which proved fatal, and 1 each on transports "Jelunga," "Aurania," and "Canada."†

Other Continued Fevers caused 24 admissions, all for simple continued fe the ratio, 34·6 per 1,000, being higher than that for 1899 by 12·1.

Dysentery gave 16 admissions, 15 of which occurred in men returning fr South Africa and 1 among men returning from Ceylon. The ratio, 23·1 1,000, is higher than that for 1899 by 13·3.

* Four other cases of small-pox occurred, namely on s.s. "Kildonan Cast on the voyage home with *invalids* from South Africa. All the cases had occup the same ward at Greenpoint Hospital, Cape Town.

† One other case of enteric fever occurred in a man of the St. John Ambula Brigade employed as sick attendant on the hospital ship "Dunera" *en route* fr Durban to England. The disease is stated to have been contracted in Natal, wh the man had previously served as a hospital orderly.

Troops on Board Ship.

Malarial Fevers.—There were 24 admissions, 23 being for ague and 1 for remittent fever, the ratio, 34·6 per 1,000, being lower than that for 1899 by 34·2.

No admissions are recorded under the head of *septic* or *tubercular diseases.*

Venereal Disease.—The admissions for *primary syphilis* were 7 in number, equal to a ratio of 10·1 per 1,000, which is lower than the previous year's rate by 25·0. Including soft chancre, for which there were 6 admissions, the total admission ratio for primary venereal sores was 18·8 per 1,000, or lower than in 1899 by 80·9. *Secondary syphilis* with 10 admissions gave a ratio of 14·4 per 1,000, which is lower than the previous year's rate by 54·4. There was 1 death due to this cause. *Gonorrhœa* caused 42 admissions, or 60·6 per 1,000, which is lower than that for 1899 by 92·5. Taking all forms of venereal disease, the total admission ratio equalled 93·9 per 1,000, as compared with 321·6 in 1899.

The remaining admissions under *other general diseases* were 7 for parasitic affections, 25 for rheumatism, 27 for debility, and 1 each for non-malignant new growth and anæmia.

LOCAL DISEASES.—For *diseases of the nervous system* 14 admissions are shown; of these 12 were for neuralgia, and 2 for paralysis.

Diseases of the Eye gave 18 admissions, the ratio per 1,000 being 26·0. The cases comprised 16 of conjunctivitis and 2 of keratitis.

There were 18 admissions for *diseases of other organs of special sense;* 14 of the cases were for aural affections, and 4 for disease of the nose.

For *diseases of the circulatory system* there were 4 admissions, comprising 3 of valvular disease of heart, and 1 of varix.

Under *diseases of the respiratory system* there were 64 admissions, equal to a ratio of 92·4 per 1,000, which is higher than the previous year's rate by 43·3. Of these 54 were for bronchial affections, 7 for pneumonia, and 3 for laryngitis.

Diseases of the Digestive System contributed 156 admissions, or a ratio of 225·1 per 1,000, which is higher than the previous year's rate by 170·3. Throat and mouth affections, diarrhœa, and indigestion were the chief causes of admission. There was 1 death from abscess of liver.

Diseases of the Lymphatic System caused 10 admissions, the ratio being 14·4 per 1,000, which is lower than in 1899 by 5·3. Under *diseases of the urinary system* 2 admissions are recorded for cystitis. *Diseases of the generative system* gave 22 admissions with a ratio of 31·8 per 1,000, which is lower by 48·4 than the previous year's rate. Soft chancre, already referred to under the heading of venereal diseases, furnished 6 cases, and there were 10 cases of ulcer of penis, and 3 each of stricture of urethra and orchitis. *Diseases of the organs of locomotion* caused 8 admissions, namely, 5 for myalgia, and 3 for synovitis, and there were 16 admissions for *diseases of the connective tissue*, or a ratio of 23·1 per 1,000, which is lower than that for 1899 by ·6. *Diseases of the skin*, with 30 admissions, gave a ratio of 43·3 per 1,000, which is lower than that for 1899 by 4·4. The admissions were chiefly due to eczema, boils, and ulcers.

INJURIES.—38 admissions are recorded under this heading, equal to a ratio of 54·8 per 1,000, as compared with 29·5 in 1899.

For *general injuries* there was 1 admission for sun-stroke, and there were 37 admissions for *local injuries*, chiefly caused by wounds, contusions, and sprains.

OFFICERS.—The number of officers embarked was 494, among whom there were 4 cases of sickness, including 2 cases of enteric fever, 1 of which occurred on transport s.s. "Cymric" and 1 on transport s.s. "Hawarden Castle." In neither case could any definite cause be assigned.

WOMEN AND CHILDREN.—Among 425 women embarked no casualties occurred. A case of small-pox which occurred among the women returning home on s.s. "Purnea" was transferred to a civil hospital at Port Said. The number of children embarked was 883, among whom 1 death occurred from eclampsia.

III.—Troops Proceeding from one Station Abroad to Another.

Troops on Board Ship.

The number of warrant officers, non-commissioned officers and men who embarked for passage between one station abroad and another was 10,018, the equivalent annual strength being 489, among whom there were 523 admissions into hospital and 3 deaths, the ratio of admission being 1,069·5 and that of mortality 6·13 per 1,000. The admission ratio is lower than the corresponding ratio in 1899 by 150·8, while that of death is higher by 1·76. In comparison with the average ratio for the preceding ten years the admission ratio shows a decrease of 6·3 and that of death a decrease of ·50.

The admissions and deaths, arranged according to the different sections of disease, are shown in Abstract XXVI.

General Diseases.—There were 3 admissions for *influenza*. *Enteric fever* caused 5 admissions with 1 death. The first case (a fatal one) occurred on the transport s.s. "Simla" on a voyage from Egypt to South Africa. The patient was admitted to hospital the day after embarkation, and the disease was contracted in Egypt. The other cases occurred among men proceeding per s.s. "Antillian" from Cape Town to Hong Kong and Wei Hai Wei. In these latter it is stated that the disease was probably contracted in South Africa.

Other continued fevers caused 10 admissions, all for simple continued fevers, the ratio, 20·5 per 1,000, being above that for 1899 by 17·1. *Dysentery* gave 4 admissions, equal to a ratio of 8·2 per 1,000 as compared with 25·3 in 1899.

Malarial fevers, with 12 admissions, gave a ratio of 24·5 per 1,000, as compared with 244·7 in the previous year. There were 3 admissions for *septic diseases*, 2 being due to erysipelas (1 fatal) and 1 to pyæmia, and a single admission is recorded under *tubercle*.

Venereal Diseases.—For *primary syphilis* there were 15 admissions, equal to a ratio of 30·7 per 1,000, which is below the previous year's rate by 55·0. If to this be added the sickness for soft chancre, for which there were 14 admissions, the total admission rate for primary venereal sores equals 59·3 per 1,000, which is lower than the corresponding rate in 1899 by 116·4. *Secondary syphilis* caused 11 admissions, or a ratio of 22·5 per 1,000, which is lower than that for the preceding year by 23·8. *Gonorrhœa* with 86 admissions gave a ratio of 175·9 per 1,000, as compared with 201·9 in the previous year. Including all forms, the total admission ratio for venereal diseases was 257·7 per 1,000, which is below the previous year's rate by 166·2.

There were 8 admissions for *parasitic diseases*, 3 being due to pediculus, 3 to scabies, and 2 to phthirius inguinalis. One case of *alcoholism* occurred. *Rheumatism* caused 27 admissions, including 1 case of rheumatic fever, equal to a ratio of 55·2 per 1,000, which is higher by 42·1 than the previous year's rate. *Debility* caused 9 admissions, and under the heading of *other general diseases* 2 admissions are recorded.

Local Diseases.—There were 9 admissions for *diseases of the nervous system*, 7 being due to neuralgia, and one each to headache and nervous weakness. *Diseases of the eye* caused 8 admissions, 5 for conjunctivitis, and 3 for stye, and there were 11 cases of *aural disease*. There were no admissions for *diseases of the circulatory system*. *Respiratory affections* gave rise to 64 admissions, of which bronchial affections accounted for ·46, the ratio, 130·9 per 1,000, being higher than that for 1899 by 106·4. There was one death from pneumonia. There were 88 admissions for *diseases of the digestive system*, including 32 for throat and mouth affections, 22 for diarrhœa, 12 for enteritis, and 4 each for inflammation of stomach, dyspepsia, hernia, and colic, the ratio, 180·0 per 1,000, being higher than that for 1899 by 135·4. *Diseases of the lymphatic system* caused 7 admissions, with a ratio of 14·3 per 1,000, which is lower than that for the previous year by 27·7. There was only one admission for *diseases of the urinary system*, viz., for incontinence of urine, and of the 24 cases returned under the heading of *diseases of the generative system* 14 were due to soft chancre,

3 each to ulcer of penis and orchitis, 2 to balanitis, and 1 each to hydrocele and varicocele, the ratio being 49·1 per 1,000, which is below the previous year's rate by 59·3. *Diseases of the organs of locomotion* gave two admissions for synovitis, and for *diseases of the connective tissue* there were 27 admissions, 12 being for inflammation, 14 for abscess, and 1 for œdema, equal to a ratio of 55·2 per 1,000, which is lower than in 1899 by 19·1. *Skin diseases* gave a ratio of 67·5 per 1,000; the admissions, 33 in number, were chiefly for eczema, ulcers and boils. *Troops on Board Ship.*

INJURIES.—There were 50 admissions, the admission ratio, 102·3 per 1,000, being above that for 1899 by 42·0. The two admissions under the heading of *general injuries* were due to sun-stroke. There were 48 admissions for *local injuries*, chiefly caused by wounds, contusions and sprains.

OFFICERS, WOMEN, AND CHILDREN.—Among 329 officers embarked there were 6 cases of sickness. Twenty-three women and 19 children embarked, among whom there were no casualties.

IV.—INVALIDS RETURNING TO ENGLAND.

The number of invalids embarked for England from stations abroad, other than from the South African Field Force,* was 2,162, and amongst these there were 17 deaths during the voyage home. The sickness and mortality amongst these invalids are accounted for in the statistical tables of the commands from which they were invalided.

V.—SANITARY CONDITION OF SHIPS.

The sanitary condition of the different vessels and the accommodation provided for the troops on the various voyages were generally reported to be satisfactory. In a few instances smells arising from horse stables and defective ventilation were noted, and were considered to have given rise to outbreaks of sore throat. The hospital accommodation was in many instances said to be unsatisfactory. Various reasons were cited, of which the following occurred most frequently:—proximity to horse stables, discomfort owing to heat, defective ventilation and lighting, and unsuitable situation. The arrangement of upper and lower cots in groups of three or four pairs was found most unsatisfactory, and sometimes in the early part of the voyage, in cases of patients suffering from diarrhœa, dysentery, seasickness, and wounds is said to have caused inconvenience to the medical officers and nurses attending them, as well as to other patients lying below or alongside. As the result of representations, steps are now being taken, as far as possible, for the provision in hospitals on all transports of a certain proportion of 1-tier cots for the treatment of serious cases; and also for the improvement in the ventilation between decks by means of mechanical ventilating fans fixed to air-shafts, so as to introduce fresh air continuously and in definite quantities.

* According to returns received at head-quarters, the number of invalids from the South African Field Force who returned to England during the year was 34,452, and 83 deaths occurred during the voyage home, but full statistics of the South African invalids are reserved for record at the close of the campaign.

ABSTRACT No. I.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the TROOPS stationed in the UNITED KINGDOM during the Year 1900, with

Average Strength in Annual Returns, 132,921. Average Strength, including Men detached, 154,464. Diseases.	Admissions into Hospital.	Deaths.			Invalids Discharged the Service.
		With the Regiment.	Absent from the Regiment.	Total.	
GENERAL DISEASES.					
Small-pox	1	—	—	—	—
Other Eruptive Fevers	1,456	15	—	15	—
Influenza	4,125	12	—	12	3
Diphtheria	69	3	1	4	—
Enteric Fever	171	37	7	44	—
Other Continued Fevers	254	5	1	6	—
Cholera	—	—	—	—	—
Dysentery	181	3	2	5	11
Yellow Fever	—	—	—	—	—
Malarial Fevers	859	2	1	3	4
Septic Diseases	253	7	—	7	1
Tubercular Diseases	493	113	8	121	280
Syphilis, Primary	2,492	—	—	—	1
,, Secondary	1,941	10	1	11	126
Gonorrhœa	6,993	—	—	—	8
Hydrophobia	—	—	1	1	—
Parasitic Diseases	3,770	—	—	—	2
Scurvy	7	—	—	—	—
Alcoholism	672	22	—	22	1
Rheumatism	4,855	8	2	10	255
Debility	1,650	2	—	2	313
Other General Diseases	548	13	4	17	83
LOCAL DISEASES.					
Diseases of the—					
Nervous System { Nervous	1,474	52	5	57	328
Nervous System { Mental	332	5	—	5	212
Eye	1,009	—	—	—	339
Other Organs of Special Sense	1,214	3	—	3	162
Circulatory System	2,185	88	12	100	1,025
Respiratory ,,	8,016	349	23	372	284
Digestive ,,	13,269	50	7	57	573
Lymphatic ,,	860	1	—	1	23
Urinary ,,	463	16	2	18	99
Generative ,,	2,861	1	—	1	109
Organs of Locomotion	1,806	3	—	3	374
Connective Tissue	3,388	—	—	—	22
Skin	6,037	1	—	1	62
INJURIES.					
General	191	50	9	59	9
Local	11,465	55	1	56	310
In Action	312	—	—	—	252
POISONS	32	3	2	5	4
No appreciable disease	494	—	—	—	—
Details not available	—	1	4	5	—
General Total	87,078	930	93	1,023	5,074

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK, among the Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Average Number constantly Sick.	Ratio per 1,000.				Average Ratio per 1,000 from 1890 to 1899.			
	Admissions.	Deaths.*	Invalids finally discharged.*	Constantly Sick.	Admissions.	Deaths.*	Invalids finally discharged.*	Constantly Sick.
·13	—	—	—	—	—	—	—	·01
106·97	11·0	·10	—	·81	9·3	·06	—	·77
142·59	31·0	·08	·02	1·07	20·9	·04	—	·61
5·94	·5	·03	—	·05	·8	·02	—	·06
24·65	1·3	·28	—	·19	1·3	·24	—	·21
9·68	1·9	·04	—	·07	3·6	·01	—	·14
—	—	—	—	—	—	—	—	—
12·84	1·4	·03	·07	·10	·5	·02	·04	·05
—	—	—	—	—	—	—	—	—
31·76	6·5	·02	·03	·24	7·0	·01	·04	·26
15·12	1·8	·04	·01	·11	1·4	·07	·01	·10
52·32	3·7	·78	1·81	·39	3·3	·70	1·75	·53
216·81	18·7	—	·01	1·63	48·2	—	·01	4·64
193·98	14·6	·07	·82	1·46	32·2	·06	·95	3·38
429·67	52·6	—	·05	3·23	76·3	—	·07	5·26
—	—	·01	—	—	—	—	—	—
123·99	28·4	—	·01	·93	23·1	—	—	·69
·30	·1	—	—	—	—	—	—	—
24·51	5·1	·14	·01	·19	1·8	·04	·01	·06
296·85	36·5	·06	1·65	2·23	31·4	·06	·65	2·07
102·64	12·4	·01	2·03	·77	7·3	—	·85	·51
31·75	4·1	·11	·54	·24	5·0	·12	·28	·35
94·58	11·1	·37	2·12	·71	6·9	·25	1·16	·48
37·73	2·5	·03	1·37	·29	1·3	·02	·91	·21
105·92	14·4	—	2·19	·80	11·0	—	·77	·68
77·46	9·1	·02	1·05	·58	8·5	·01	1·03	·57
165·07	16·4	·65	6·63	1·24	10·1	·35	3·67	1·02
434·03	60·3	2·41	1·83	3·27	57·3	1·04	·73	2·84
469·31	99·8	·37	2·41	3·53	107·1	·29	1·10	3·25
65·07	6·5	·01	·15	·49	12·7	·01	·12	1·37
31·72	3·5	·12	·64	·24	2·3	·13	·33	·21
166·32	21·5	·01	·71	1·25	27·6	—	·29	1·83
107·76	13·6	·02	2·42	·81	10·2	·02	1·33	·75
149·84	25·5	—	·14	1·13	24·4	·01	·06	1·05
287·48	45·4	·01	·40	2·16	47·8	—	·22	2·09
10·25	1·4	·38	·06	·08	·4	·33	·02	·13
499·68	86·3	·36	2·01	3·76	102·0	·33	·80	4·26
22·88	2·3	—	1·63	·17	—	—	—	—
1·77	·2	·03	·03	·01	·2	·05	—	·01
11·64	3·7	—	—	·11	3·3	—	—	·11
—	—	·03	—	—	—	—	—	·03
4564·01	655·1	6·62	32·85	34·34	706·5	4·29	17·20	40·69

* These ratios are calculated on the strength including men detached,

ABSTRACT A.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, and DEATHS of TROOPS stationed in ENGLAND and WALES during the Year 1900, with

Diseases. (Average Strength in Annual Returns, 98,728. Average Strength, including Men detached, 114,855.)	Admissions into Hospital.	Deaths. With the regiment.	Deaths. Absent from the regiment.	Deaths. Total.	Invalids Discharged the Service.	Average Number constantly Sick.
GENERAL DISEASES.						
Small-pox	1	—	—	—	—	·13
Other Eruptive Fevers	1,247	12	—	12	—	87·89
Influenza	3,402	9	—	9	2	120·83
Diphtheria	48	3	—	3	—	3·97
Enteric Fever	114	26	6	32	—	16·61
Other continued Fevers	193	2	1	3	—	6·83
Cholera	—	—	—	—	—	—
Dysentery	156	3	1	4	10	11·05
Yellow Fever	—	—	—	—	—	—
Malarial Fevers	708	1	1	2	3	26·17
Septic Diseases	192	7	—	7	1	12·51
Tubercular Diseases	374	82	5	87	222	37·74
Syphilis, Primary	1,842	—	—	—	1	171·54
,, Secondary	1,505	7	1	8	87	151·31
Gonorrhœa	5,065	—	—	—	8	322·95
Hydrophobia	—	—	1	1	—	—
Parasitic Diseases	2,792	—	—	—	2	91·04
Scurvy	3	—	—	—	—	·20
Alcoholism	523	13	—	13	1	20·04
Rheumatism	3,582	8	1	9	213	219·06
Debility	1,268	2	—	2	259	78·48
Other General Diseases	450	8	4	12	73	24·24
LOCAL DISEASES.						
Diseases of the—						
Nervous System { Nervous	1,108	42	4	46	259	72·33
Nervous System { Mental	224	4	—	4	162	24·30
Eye	1,440	—	—	—	295	81·29
Other Organs of Special Sense	998	3	—	3	138	65·20
Circulatory System	1,711	71	12	83	878	129·50
Respiratory ,,	5,956	279	19	298	225	324·09
Digestive ,,	10,360	35	7	42	324	367·87
Lymphatic ,,	653	—	—	—	19	49·29
Urinary ,,	361	12	2	14	71	23·68
Generative ,,	2,207	1	—	1	87	129·35
Organs of Locomotion	1,366	2	—	2	293	77·88
Connective Tissue	2,606	—	—	—	15	116·35
Skin	4,324	1	—	1	57	205·63
INJURIES.						
General	182	38	6	44	7	9·62
Local	8,191	38	1	39	246	354·41
In Action	295	—	—	—	228	19·59
POISONS	29	3	2	5	4	1·54
No appreciable disease	409	—	—	—	—	11·32
Cause unknown (refers to deaths only)	—	1	4	5	—	—
General Total	65,885	713	78	791	4,190	3,465·83

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK, among the the Ratios per 1,000 of the Strength, and the Average Ratios for 10 years.

Ratio per 1,000.				Average Ratio per 1,000 from 1890 to 1899.			
Admissions.	Deaths.*	Invalids finally Discharged.*	Constantly Sick.	Admissions.	Deaths.*	Invalids finally Discharged.*	Constantly Sick.
—	—	—	—	—	—	—	·01
12·6	·10	—	·89	10·8	·06	—	·92
34·5	·08	·02	1·22	22·9	·04	—	·67
·5	·03	—	·04	1·0	·02	—	·07
1·2	·28	—	·17	1·1	·20	—	·18
2·0	·03	—	·07	3·4	·01	—	·14
—	—	—	—	—	—	—	—
1·6	·03	·09	·11	·6	·02	·04	·06
—	—	—	—	—	—	—	—
7·2	·02	·03	·27	8·1	·02	·05	·30
1·9	·06	·01	·13	1·4	·08	·01	·10
3·8	·76	1·93	·38	3·3	·68	1·78	·53
18·7	—	·01	1·74	52·0	—	·01	5·05
15·2	·07	·76	1·53	34·9	·07	1·04	3·75
51·3	—	·07	3·27	79·1	—	·08	5·56
—	·01	—	—	—	—	—	—
28·3	—	·02	·92	23·6	—	—	·70
—	—	—	—	—	—	—	—
5·3	·11	·01	·20	1·8	·04	—	·09
36·3	·08	1·86	2·22	33·2	·06	·66	2·23
12·8	·02	2·25	·79	7·5	·01	·87	·54
4·6	·10	·64	·25	5·2	·12	·29	·38
11·2	·40	2·25	·73	7·1	·26	1·20	·50
2·3	·03	1·41	·25	1·2	·02	·85	·18
14·6	—	2·57	·82	10·8	—	·81	·67
10·1	·03	1·20	·66	9·0	·02	1·08	·60
17·3	·72	7·64	1·51	10·1	·36	3·78	1·05
60·3	2·59	1·96	3·28	58·0	1·09	·72	2·88
104·9	·37	2·82	3·73	112·5	·30	1·14	3·51
6·6	—	·17	·50	13·5	—	·11	1·48
3·7	·12	·62	·24	2·2	·14	·32	·21
22·3	·01	·76	1·31	28·0	·01	·30	1·91
13·8	·02	2·55	·79	9·9	·01	1·37	·75
26·4	—	·13	1·18	24·1	·01	·07	1·05
48·8	·01	·50	2·08	46·9	—	·21	2·04
1·8	·38	·06	·10	·5	·30	·02	·03
88·0	·34	2·14	3·59	100·0	·33	·84	4·22
3·0	—	1·98	·20	—	—	—	—
·3	·04	·03	·02	·2	·05	—	·01
4·1	—	—	·11	3·7	—	—	·13
—	·04	—	—	—	—	—	·04
667·3	6·89	36·48	35·10	727·6	4·33	17·65	42·50

* These ratios are calculated on the strength including men detached.

ABSTRACT B.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS among the TROOPS stationed in SCOTLAND during the Year 1900, with

Average Strength in Annual Returns, 7,736. Average Strength, including men detached, 8,704. Diseases.	Admissions into Hospital.	Deaths.			Invalids Discharged the Service.	Average Number constantly Sick.
		With the regiment.	Absent from the regiment.	Total.		
GENERAL DISEASES.						
Small-pox	—	—	—	—	—	—
Other Eruptive Fevers	57	1	—	1	—	6·58
Influenza	123	1	—	1	—	3·52
Diphtheria	3	—	—	—	—	·29
Enteric Fever	10	2	—	2	—	1·40
Other Continued Fevers	16	1	—	1	—	·20
Cholera	—	—	—	—	—	—
Dysentery	2	—	—	—	—	·17
Yellow Fever	—	—	—	—	—	—
Malarial Fevers	18	—	—	—	—	·57
Septic Diseases	11	—	—	—	—	·58
Tubercular Diseases	21	4	1	5	8	1·94
Syphilis, Primary	93	—	—	—	—	6·22
,, Secondary	76	3	—	3	3	4·84
Gonorrhœa	326	—	—	—	—	15·20
Hydrophobia	—	—	—	—	—	—
Parasitic Diseases	185	—	—	—	—	4·67
Scurvy	1	—	—	—	—	·05
Alcoholism	41	2	—	2	—	1·19
Rheumatism	213	—	—	—	7	10·96
Debility	57	—	—	—	1	2·61
Other General Diseases	12	1	—	1	1	·69
LOCAL DISEASES.						
Diseases of the—						
Nervous System { Nervous	73	3	—	3	12	5·41
Nervous System { Mental	21	—	—	—	6	2·21
Eye	71	—	—	—	4	3·07
Other Organs of Special Sense	20	—	—	—	1	·58
Circulatory System	60	3	—	3	18	3·18
Respiratory ,,	314	15	1	16	12	14·15
Digestive ,,	406	4	—	4	4	11·52
Lymphatic ,,	28	1	—	1	1	1·00
Urinary ,,	19	1	—	1	3	1·36
Generative ,,	100	—	—	—	2	4·68
Organs of Locomotion	59	1	—	1	6	3·32
Connective Tissue	141	—	—	—	—	4·76
Skin	304	—	—	—	2	11·92
INJURIES.						
General	4	4	2	6	—	·28
Local	540	6	—	6	11	23·65
In Action	—	—	—	—	—	—
POISONS	1	—	—	—	—	·02
No appreciable disease	25	—	—	—	—	1·27
Cause unknown (refers to deaths only)	—	—	—	—	—	—
General Total	3,446	53	4	57	102	154·66

into Hospital, Disease, Invaliding and Constantly Sick, the Ratios per 1,000 of the Strength, and the Average Daily Number of Days

Admissions.	Deaths.*	Invalids finally invalided.	Constantly Sick.	Average Daily Number of Admissions.	Deaths.*	Average Daily Number of Invalids finally invalided.	Average Daily Number Constantly Sick.
—	—	—	—	—	—	—	—
7·4	—	—	—	[illegible]	—	—	—
15·9	·12	—	[illegible]	[illegible]	[illegible]	—	—
1·4	·12	—	—	—	—	—	—
1·3	—	—	[illegible]	[illegible]	[illegible]	—	—
2·1	·23	—	—	[illegible]	—	—	—
—	·12	—	[illegible]	[illegible]	—	—	—
·3	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
2·3	—	—	[illegible]	[illegible]	—	—	[illegible]
1·4	—	—	[illegible]	[illegible]	·11	—	[illegible]
2·7	·27	·27	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
12·0	—	—	[illegible]	[illegible]	—	—	[illegible]
9·6	·24	·24	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
42·1	—	—	1·35	[illegible]	—	[illegible]	[illegible]
—	—	—	—	—	—	—	—
22·9	—	—	[illegible]	[illegible]	—	—	[illegible]
·1	—	—	[illegible]	[illegible]	—	—	[illegible]
5·6	·23	—	[illegible]	[illegible]	[illegible]	—	[illegible]
27·6	—	·69	1·62	[illegible]	[illegible]	[illegible]	1·39
7·4	—	·12	[illegible]	[illegible]	—	[illegible]	[illegible]
1·6	·12	·12	[illegible]	[illegible]	·16	·6	·16
9·4	·24	1·68	[illegible]	[illegible]	·12	1·12	[illegible]
2·7	—	[illegible]	[illegible]	[illegible]	—	[illegible]	[illegible]
9·3	—	[illegible]	[illegible]	[illegible]	—	[illegible]	[illegible]
2·6	—	·12	[illegible]	[illegible]	—	[illegible]	[illegible]
7·6	·24	2·07	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
20·6	1·24	1·68	[illegible]	[illegible]	1·17	1·27	[illegible]
22·6	·68	[illegible]	1·69	[illegible]	[illegible]	[illegible]	[illegible]
3·0	·12	·12	·21	[illegible]	[illegible]	·11	[illegible]
2·6	·13	·24	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
12·0	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7·4	·12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1·44
13·2	—	—	[illegible]	[illegible]	[illegible]	1·23	[illegible]
20·3	—	·23	1·54	[illegible]	—	·13	1·85
·3	·69	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
20·6	·69	1·26	3·06	24·7	·48	·90	3·41
—	—	—	—	—	—	—	—
·1	—	—	—	·1	·06	·03	—
3·2	—	—	·16	2·2	·03	—	·05
—	—	—	—	—	—	—	—
448·4	6·66	11·72	19·99	562·0	5·18	15·73	26·07

* These ratios are calculated on the strength including men detached.

ABSTRACT C.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS among the TROOPS stationed in IRELAND during the Year 1900, with

Average Strength in Annual Returns, 26,457. Average Strength, including Men detached, 30,905. Diseases.	Admissions into Hospital.	Deaths. With the regiment.	Deaths. Absent from the regiment.	Deaths. Total.	Invalids discharged the Service.	Average Number constantly Sick.
GENERAL DISEASES.						
Small-pox	—	—	—	—	—	—
Other Eruptive Fevers	152	2	—	2	—	12·50
Influenza	600	2	—	2	1	18·24
Diphtheria	18	—	1	1	—	1·68
Enteric Fever	47	9	1	10	—	6·64
Other Continued Fevers	45	2	—	2	—	2·65
Cholera	—	—	—	—	—	—
Dysentery	23	—	1	1	1	1·62
Yellow Fever	—	—	—	—	—	—
Malarial Fevers	133	1	—	1	1	5·02
Septic Diseases	30	—	—	—	—	2·03
Tubercular Diseases	98	27	2	29	50	12·64
Syphilis, Primary	557	—	—	—	—	39·05
,, Secondary	360	—	—	—	36	37·83
Gonorrhœa	1,602	—	—	—	—	91·52
Hydrophobia	—	—	—	—	—	—
Parasitic Diseases	793	—	—	—	—	28·28
Scurvy	3	—	—	—	—	·05
Alcoholism	108	7	—	7	—	3·28
Rheumatism	1,060	—	1	1	35	66·83
Debility	325	—	—	—	53	21·55
Other General Diseases	86	4	—	4	9	6·82
LOCAL DISEASES.						
Diseases of the—						
Nervous System { Nervous	293	7	1	8	57	16·84
Nervous System { Mental	87	1	—	1	44	11·22
Eye	398	—	—	—	40	21·56
Other Organs of Special Sense	196	—	—	—	23	11·68
Circulatory System	414	14	—	14	129	32·39
Respiratory ,,	1,746	55	3	58	46	95·79
Digestive ,,	2,503	11	—	11	45	89·92
Lymphatic ,,	184	—	—	—	3	14·18
Urinary ,,	83	3	—	3	25	6·18
Generative ,,	554	—	—	—	20	32·29
Organs of Locomotion	581	—	—	—	75	26·56
Connective Tissue	641	—	—	—	7	28·73
Skin	1,409	—	—	—	3	69·93
INJURIES.						
General	5	8	1	9	2	·35
Local	2,734	11	—	11	53	121·62
In action	17	—	—	—	24	3·29
POISONS	2	—	—	—	—	·21
No appreciable disease	60	—	—	—	—	2·05
Cause unknown (refers to deaths only)	—	—	—	—	—	—
General Total	17,747	161	11	175	782	943·52

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK, the Ratios per 1,000 of the Strength, and the Average ratios for 10 Years.

Ratio per 1,000.				Average Ratio per 1,000 from 1890 to 1899.			
Admissions.	Deaths.*	Invalids finally Discharged.*	Constantly Sick.	Admissions.	Deaths.*	Invalids finally Discharged.*	Constantly Sick.
—	—	—	—	—	—	—	—
5·7	·06	—	·47	5·0	·05	—	·35
22·7	·06	·03	·69	16·4	·05	—	·50
·7	·03	—	·06	·3	·03	—	·03
1·8	·32	—	·25	1·9	·37	—	·34
1·7	·06	—	·10	4·0	·01	—	·16
—	—	—	—	—	—	—	—
·9	·03	·03	·03	·3	—	·03	·02
—	—	—	—	—	—	—	—
5·0	·03	·03	·19	4·3	·01	·03	·16
1·1	—	—	·08	1·1	·03	·01	·09
3·7	·94	1·62	·48	3·3	·73	1·74	·53
21·1	—	—	1·48	39·9	—	—	3·77
13·6	—	1·16	1·43	25·3	·04	·69	2·50
60·6	—	—	3·46	69·4	—	·05	4·97
—	—	—	—	—	—	—	—
30·0	—	—	1·07	22·1	—	—	·71
·1	—	—	—	·1	—	—	—
4·1	·23	—	·12	1·7	·03	·02	·06
40·1	·03	1·13	2·53	27·1	·05	·88	1·73
12·3	—	1·72	·81	7·1	—	·78	·47
3·2	·13	·29	·26	4·3	·11	·24	·29
11·1	·26	1·84	·64	6·3	·20	1·06	·42
3·3	·03	1·42	·42	1·5	·02	1·10	·27
15·0	—	1·29	·82	11·8	—	·64	·74
7·4	—	·74	·44	7·5	—	·94	·53
15·6	·45	4·17	1·22	10·4	·30	3·47	·98
66·0	1·88	1·49	3·62	56·0	·90	·66	2·83
94·6	·36	1·46	3·40	93·3	·26	1·03	3·02
7·0	—	·10	·54	11·1	—	·15	1·16
3·1	·10	·81	·25	2·3	·11	·35	·23
20·9	—	·65	1·22	26·1	—	·28	1·66
14·4	—	2·43	1·00	10·8	·02	1·25	·76
24·2	—	·23	1·09	24·6	—	·06	1·08
53·3	—	·10	2·64	50·1	—	·24	2·25
·2	·79	·06	·01	·3	·38	·01	·02
103·3	·30	1·72	4·60	108·9	·31	·68	4·49
·6	—	·78	·12	—	—	—	—
·1	—	—	·01	·1	·03	·01	·01
2·3	—	—	·08	2·4	—	—	·08
—	—	—	—	—	—	—	—
670·3	5·66	25·30	35·66	657·1	4·04	16·10	37·21

* These ratios are calculated on the strength including men detached.

ABSTRACT D.—TABLE showing the AVERAGE STRENGTH, SICKNESS UNITED KINGDOM during the year 1900,

Average Strength.	Officers, 3,996.			
Diseases.	Attacks of Illness.	Deaths.	Ratio per 1,000.	
			Attacks.	Deaths.
GENERAL DISEASES.				
Small-pox	—	—	—	—
Other Eruptive Fevers	48	—	12·0	—
Influenza	260	1	65·1	·25
Diphtheria	—	—	—	—
Enteric Fever	5	—	1·2	—
Other Continued Fevers	6	—	1·5	—
Cholera	—	—	—	—
Dysentery	5	—	1·2	—
Malarial Fevers	26	—	6·5	—
Septic Diseases	3	1	·7	·25
Tubercular Diseases	—	—	—	—
Syphilis, Primary	—	—	—	—
,, Secondary	—	—	—	—
Gonorrhœa	3	—	·7	—
Hydrophobia	—	—	—	—
Parasitic Diseases	—	—	—	—
Scurvy	—	—	—	—
Alcoholism	1	—	·2	—
Rheumatism	44	—	11·0	—
Debility	22	—	5·5	—
Other General Diseases	12	2	3·0	·50
LOCAL DISEASES.				
Diseases of the—				
Nervous System { Nervous	38	3	9·5	·75
Nervous System { Mental	—	—	—	—
Eye	9	—	2·3	—
Other Organs of Special Sense	8	—	2·0	—
Circulatory System	15	4	3·8	1·00
Respiratory ,,	218	3	54·6	·75
Digestive ,,	256	—	64·1	—
Lymphatic ,,	14	—	3·5	—
Urinary ,,	12	—	3·0	—
Generative ,,	13	—	3·3	—
Organs of Locomotion	51	—	12·8	—
Connective Tissue	34	—	8·5	—
Skin	41	—	10·3	—
INJURIES.				
General	9	1	2·3	·25
Local	174	1	43·5	·25
In Action	—	—	—	—
POISONS	—	—	—	—
No appreciable disease	2	—	·5	—
General Total	1,329	16	332·6	4·00

and MORTALITY among the OFFICERS, WOMEN, and CHILDREN in the with the Ratios per 1,000 of the Strength.

Women, 9,148.				Children, 18,186.			
Attacks of Illness.	Deaths.	Ratio per 1,000.		Attacks of Illness.	Deaths.	Ratio per 1,000.	
		Attacks.	Deaths.			Attacks.	Deaths.
—	—	—	—	—	—	—	—
36	—	3·9	—	1,835	34	101·1	1·87
388	—	42·4	—	412	5	22·7	·27
5	—	·6	—	89	17	4·9	·93
15	1	1·6	·11	16	—	·9	—
7	1	·8	·11	48	1	2·6	·06
—	—	—	—	—	—	—	—
7	—	·8	—	5	—	·3	—
24	—	2·6	—	24	1	1·3	·06
25	1	2·7	·11	9	1	·5	·06
39	6	4·3	·65	52	15	2·9	·82
3	—	·3	—	1	1	·0	·06
1	—	·1	—	2	—	·1	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
7	—	·8	—	144	—	7·9	—
—	—	—	—	—	—	—	—
5	1	·6	·11	—	—	—	—
215	2	23·5	·22	82	1	4·5	·06
635	2	69·4	·22	599	20	32·9	1·10
129	7	14·1	·76	606	35	33·4	1·93
162	4	17·7	·44	221	63	12·2	3·47
1	—	·1	—	1	—	·0	—
31	—	3·4	—	186	—	10·2	—
8	—	·9	—	40	—	2·2	—
76	6	8·3	·65	26	3	1·4	·16
578	13	63·2	1·42	2,584	94	142·3	5·18
884	—	96·6	—	2,163	69	119·1	3·80
15	—	1·6	—	71	—	3·9	—
16	5	1·7	·55	7	1	·4	·06
281	3	30·7	·33	58	1	3·2	·06
26	—	2·9	—	12	—	·7	—
85	1	9·3	·11	137	2	7·5	·11
127	—	13·9	—	419	—	23·1	—
2	—	·2	—	8	3	·4	·16
80	—	8·8	—	325	11	17·9	·60
—	—	—	—	—	—	—	—
1	—	·1	—	—	—	—	—
1	—	·1	—	3	—	·2	—
3,915	53	428·0	5·79	10,185	378	560·8	20·82

ABSTRACT No. II.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the TROOPS stationed at GIBRALTAR during the year 1900, with the Ratios

Average Strength, 4,858. Diseases.	Admissions into Hospital.	Deaths. In the Command	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent Home.	Invalids. Number finally Discharged the Service.	Average number constantly sick.
GENERAL DISEASES.							
Small-pox	4	—	—	—	—	—	·31
Other Eruptive Fevers	12	—	—	—	—	—	1·52
Influenza	5	—	—	—	—	—	·27
Diphtheria	—	—	—	—	—	—	—
Enteric Fever	21	7	—	7	—	—	2·37
Other Continued Fevers	43	1	—	1	2	1	3·53
Cholera	—	—	—	—	—	—	—
Dysentery	2	—	—	—	—	—	·15
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	5	—	—	—	—	—	·17
Septic Diseases	2	1	—	1	—	—	·08
Tubercular Diseases	10	2	—	2	6	6	·26
Syphilis, Primary	19	—	—	—	—	—	2·05
,, Secondary	61	—	—	—	7	3	8·23
Gonorrhœa	533	—	—	—	—	—	45·10
Hydrophobia	—	—	—	—	—	—	—
Parasitic diseases	70	—	—	—	—	—	2·38
Scurvy	—	—	—	—	—	—	—
Alcoholism	36	1	—	1	—	—	1·20
Rheumatism	70	—	—	—	8	2	5·75
Debility	38	—	—	—	12	3	3·63
Other General Diseases	20	—	—	—	—	—	·90
LOCAL DISEASES.							
Diseases of the—							
Nervous System (Nervous)	25	1	—	1	8	6	3·60
Nervous System (Mental)	6	1	—	1	6	8	·61
Eye	44	—	—	—	10	7	4·02
Other Organs of Special Sense	24	—	—	—	—	2	1·77
Circulatory System	37	—	—	—	14	7	5·03
Respiratory ,,	124	2	—	2	8	3	9·33
Digestive ,,	380	2	—	2	5	—	11·78
Lymphatic ,,	48	—	—	—	2	1	4·93
Urinary ,,	10	—	—	—	3	3	1·27
Generative ,,	298	—	—	—	—	—	24·52
Organs of Locomotion	43	—	—	—	8	4	3·38
Connective Tissue	123	—	—	—	1	1	6·12
Skin	139	—	—	—	—	—	8·93
INJURIES.							
General	7	—	—	—	—	—	·13
Local	274	5	—	5	2	2	15·16
In Action	—	—	—	—	—	—	—
POISONS	1	—	1	1	—	—	·07
No appreciable disease	33	—	—	—	—	—	·92
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	2,573	23	1	24	102	59	180·37

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among per 1,000 of the Strength, and the Average Ratios for 10 years.

Ratio per 1,000.					Average Ratio per 1,000 from 1890 to 1899.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
·8	—	—	—	·06	—	—	—	—	—
2·5	—	—	—	·31	1·0	—	—	—	·12
1·0	—	—	—	·06	21·0	—	—	—	·40
—	—	—	—	—	·1	—	—	—	·01
4·3	1·41	—	—	·53	3·6	·89	·49	—	·66
8·9	·21	·41	·21	·73	19·0	·09	·72	·11	1·84
—	—	—	—	—	—	—	—	—	—
·4	—	—	—	·03	·4	·2	—	—	·03
—	—	—	—	—	—	—	—	—	—
1·0	—	—	—	·03	7·6	—	·06	·02	·27
·4	·21	—	—	·02	·7	·04	—	—	·04
2·1	·41	1·23	1·23	·18	1·9	·51	1·40	1·28	·36
3·9	—	—	—	·42	20·9	—	—	·02	2·32
12·6	—	1·44	·62	1·69	23·0	·04	·83	·36	2·75
109·7	—	—	—	9·28	129·7	—	·15	·04	16·76
—	—	—	—	—	—	·02	—	—	—
11·4	—	—	—	·49	13·2	—	—	—	·46
—	—	—	—	—	—	—	—	—	—
7·4	·21	—	—	·37	6·2	·09	·04	—	·25
15·7	—	1·65	·41	1·20	26·1	·02	·64	·15	1·64
7·8	—	2·47	·62	·75	4·8	·02	·85	·47	·40
4·1	—	—	—	·19	7·1	·09	·36	·19	·57
5·2	·21	1·65	1·23	·62	9·3	·17	1·13	·91	·58
1·2	·21	1·23	1·65	·13	1·2	·04	1·17	1·17	·34
9·1	—	2·06	1·44	·83	9·7	—	·79	·62	·82
4·9	—	—	·41	·36	9·6	—	·81	·56	·66
7·6	—	2·88	1·44	1·04	5·1	·32	1·34	1·15	·64
25·5	·41	1·65	·62	1·92	26·3	·36	·83	·36	1·64
78·2	·41	1·03	—	2·42	93·4	·28	·70	·38	2·86
9·9	—	·41	·21	1·01	16·5	—	·45	·26	2·18
2·1	—	·62	·62	·26	2·3	·09	·23	·15	·23
61·3	—	—	—	5·05	99·7	·02	·15	·11	9·05
8·9	—	1·65	·82	·70	8·2	·04	·64	·53	·66
25·3	—	·21	·21	1·26	25·3	—	·15	·06	1·22
28·6	—	—	—	1·84	42·1	—	·13	·06	2·07
1·4	—	—	—	·03	·3	·28	·08	·09	·05
56·4	1·03	·41	·41	3·12	102·9	·42	·45	·40	4·61
—	—	—	—	—	—	—	—	—	—
·2	·21	—	—	·01	—	—	—	—	—
6·8	—	—	—	·19	3·7	—	—	—	·15
—	—	—	—	—	—	—	—	—	—
529·6	4·94	21·00	12·15	37·13	741·9	3·83	14·41	9·44	50·52

ABSTRACT No. I.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the TROOPS stationed in the UNITED KINGDOM during the Year 1900, with

Average Strength in Annual Returns, 132,921. Average Strength, including Men detached, 154,464. — Diseases.	Admissions into Hospital.	Deaths.			Invalided Discharged the Service.
		With the Regiment.	Absent from the Regiment.	Total.	
GENERAL DISEASES.					
Small-pox	1	—	—	—	—
Other Eruptive Fevers	1,456	15	—	15	—
Influenza	4,125	12	—	12	3
Diphtheria	69	3	1	4	—
Enteric Fever	171	37	7	44	—
Other Continued Fevers	254	5	1	6	—
Cholera	—	—	—	—	—
Dysentery	181	3	2	5	11
Yellow Fever	—	—	—	—	—
Malarial Fevers	859	2	1	3	4
Septic Diseases	253	7	—	7	1
Tubercular Diseases	493	113	8	121	280
Syphilis, Primary	2,492	—	—	—	1
,, Secondary	1,941	10	1	11	136
Gonorrhœa	6,993	—	—	—	8
Hydrophobia	—	—	1	1	—
Parasitic Diseases	3,770	—	—	—	2
Scurvy	7	—	—	—	—
Alcoholism	672	22	—	22	1
Rheumatism	4,856	8	2	10	255
Debility	1,650	2	—	2	313
Other General Diseases	548	13	4	17	83
LOCAL DISEASES.					
Diseases of the—					
Nervous System { Nervous	1,474	52	5	57	328
Nervous System { Mental	332	5	—	5	212
Eye	1,909	—	—	—	230
Other Organs of Special Sense	1,214	3	—	3	162
Circulatory System	2,185	88	12	100	1,025
Respiratory ,,	8,016	349	23	372	283
Digestive ,,	13,269	50	7	57	373
Lymphatic ,,	860	1	—	1	23
Urinary ,,	463	16	2	18	89
Generative ,,	2,861	1	—	1	109
Organs of Locomotion	1,806	3	—	3	374
Connective Tissue	3,388	—	—	—	22
Skin	6,037	1	—	1	62
INJURIES.					
General	191	50	9	59	9
Local	11,465	55	1	56	310
In Action	312	—	—	—	282
POISONS	32	3	2	5	4
No appreciable disease	494	—	—	—	—
Details not available	—	1	4	5	—
General Total	87,078	930	93	1,023	5,074

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK, among the Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Average Number constantly Sick.	Ratio per 1,000.				Average Ratio per 1,000 from 1890 to 1899.			
	Admissions.	Deaths.*	Invalids finally discharged.*	Constantly Sick.	Admissions.	Deaths.*	Invalids finally discharged.*	Constantly Sick.
·13	—	—	—	—	—	—	—	·01
106·97	11·0	·10	—	·81	9·3	·06	—	·77
142·59	31·0	·08	·02	1·07	20·9	·04	—	·61
5·94	·5	·03	—	·05	·8	·02	—	·06
24·65	1·3	·28	—	·19	1·3	·24	—	·21
9·68	1·9	·04	—	·07	3·6	·01	—	·14
—	—	—	—	—	—	—	—	—
12·84	1·4	·03	·07	·10	·5	·02	·04	·05
—	—	—	—	—	—	—	—	—
31·76	6·5	·02	·03	·24	7·0	·01	·04	·26
15·12	1·8	·04	·01	·11	1·4	·07	·01	·10
52·32	3·7	·78	1·81	·39	3·3	·70	1·75	·53
216·81	18·7	—	·01	1·63	48·2	—	·01	4·64
193·98	14·6	·07	·82	1·46	32·2	·06	·95	3·38
429·67	52·6	—	·05	3·23	16·3	—	·07	5·26
—	—	·01	—	—	—	—	—	—
123·99	28·4	—	·01	·93	23·1	—	—	·69
·30	·1	—	—	—	—	—	—	—
24·51	5·1	·14	·01	·19	1·8	·04	·01	·06
296·85	36·5	·06	1·65	2·23	31·4	·06	·65	2·07
102·64	12·4	·01	2·03	·77	7·3	—	·85	·51
31·75	4·1	·11	·54	·24	5·0	·12	·28	·35
94·58	11·1	·37	2·12	·71	6·9	·25	1·16	·48
37·73	2·5	·03	1·37	·29	1·3	·02	·91	·21
105·92	14·4	—	2·19	·80	11·0	—	·77	·68
77·46	9·1	·02	1·05	·58	8·5	·01	1·03	·57
165·07	16·4	·65	6·63	1·24	10·1	·35	3·67	1·02
434·03	60·3	2·41	1·83	3·27	57·3	1·04	·73	2·84
469·31	99·8	·37	2·41	3·53	107·1	·29	1·10	3·25
65·07	6·5	·01	·15	·49	12·7	·01	·12	1·37
31·72	3·5	·12	·64	·24	2·3	·13	·33	·21
166·32	21·5	·01	·71	1·25	27·6	—	·29	1·83
107·76	13·6	·02	2·42	·81	10·2	·02	1·33	·75
149·84	25·5	—	·14	1·13	24·4	·01	·06	1·05
287·48	45·4	·01	·40	2·16	47·8	—	·22	2·09
10·25	1·4	·38	·06	·08	·4	·33	·02	·13
499·68	86·3	·36	2·01	3·76	102·0	·33	·80	4·26
22·88	2·3	—	1·63	·17	—	—	—	—
1·77	·2	·03	·03	·01	·2	·05	—	·01
11·64	3·7	—	—	·11	3·3	—	—	·11
—	—	·03	—	—	—	—	—	·03
4564·01	655·1	6·62	32·85	34·34	706·5	4·29	17·20	40·69

* These ratios are calculated on the strength including men detached,

ABSTRACT A.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into TROOPS stationed in ENGLAND and WALES during the Year 1900, with

Average Strength in Annual Returns, 98,728. Average Strength, including Men detached, 114,855. Diseases.	Admissions into Hospital.	Deaths. With the regiment.	Deaths. Absent from the regiment.	Deaths. Total.	Invalids Discharged the Service.	Average Number constantly Sick.
GENERAL DISEASES.						
Small-pox	1	—	—	—	—	·13
Other Eruptive Fevers	1,247	12	—	12	—	87·89
Influenza	3,402	9	—	9	2	120·83
Diphtheria	48	3	—	3	—	3·97
Enteric Fever	114	26	6	32	—	16·61
Other continued Fevers	193	2	1	3	—	6·63
Cholera	—	—	—	—	—	—
Dysentery	156	3	1	4	10	11·05
Yellow Fever	—	—	—	—	—	—
Malarial Fevers	708	1	1	2	3	26·17
Septic Diseases	192	7	—	7	1	12·51
Tubercular Diseases	374	82	5	87	222	37·74
Syphilis, Primary	1,842	—	—	—	1	171·54
,, Secondary	1,506	7	1	8	87	151·31
Gonorrhœa	5,065	—	—	—	8	322·96
Hydrophobia	—	—	1	1	—	—
Parasitic Diseases	2,792	—	—	—	2	91·04
Scurvy	3	—	—	—	—	·20
Alcoholism	523	13	—	13	1	20·04
Rheumatism	3,582	8	1	9	213	219·06
Debility	1,268	2	—	2	259	78·48
Other General Diseases	450	8	4	12	73	24·24
LOCAL DISEASES.						
Diseases of the—						
Nervous System { Nervous	1,108	42	4	46	259	72·33
Nervous System { Mental	224	4	—	4	162	24·30
Eye	1,440	—	—	—	295	81·29
Other Organs of Special Sense	998	3	—	3	138	65·20
Circulatory System	1,711	71	12	83	878	129·50
Respiratory ,,	5,956	279	19	298	225	324·09
Digestive ,,	10,360	35	7	42	324	367·87
Lymphatic ,,	653	—	—	—	19	49·29
Urinary ,,	361	12	2	14	71	23·68
Generative ,,	2,207	1	—	1	87	129·35
Organs of Locomotion	1,366	2	—	2	293	77·88
Connective Tissue	2,606	—	—	—	15	116·35
Skin	4,324	1	—	1	57	205·63
INJURIES.						
General	182	38	6	44	7	9·62
Local	8,191	38	1	39	246	354·41
In Action	295	—	—	—	228	19·89
POISONS	29	3	2	5	4	1·54
No appreciable disease	409	—	—	—	—	11·32
Cause unknown (refers to deaths only)	—	1	4	5	—	—
General Total	65,885	713	78	791	4,190	3,465·33

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK, among the the Ratios per 1,000 of the Strength, and the Average Ratios for 10 years.

Ratio per 1,000.				Average Ratio per 1,000 from 1890 to 1899.			
Admissions.	Deaths.*	Invalids finally Discharged.*	Constantly Sick.	Admissions.	Deaths.*	Invalids finally Discharged.*	Constantly Sick.
—	—	—	—	—	—	—	·01
12·6	·10	—	·89	10·8	·06	—	·92
34·5	·08	·02	1·24	22·9	·04	—	·67
·5	·03	—	·04	1·0	·02	—	·07
1·2	·28	—	·17	1·1	·20	—	·18
2·0	·03	—	·07	3·4	·01	—	·14
—	—	—	—	—	—	—	—
1·6	·03	·09	·11	·6	·02	·04	·06
—	—	—	—	—	—	—	—
7·2	·02	·03	·27	8·1	·02	·05	·30
1·9	·06	·01	·13	1·4	·08	·01	·10
3·8	·76	1·93	·38	3·3	·68	1·78	·53
18·7	—	·01	1·74	52·0	—	·01	5·05
15·2	·07	·76	1·53	34·9	·07	1·04	3·75
61·3	—	·07	3·27	79·1	—	·08	5·56
—	·01	—	—	—	—	—	—
28·3	—	·02	·92	23·6	—	—	·70
—	—	—	—	—	—	—	—
5·3	·11	·01	·20	1·8	·04	—	·06
36·3	·08	1·85	2·22	33·2	·06	·66	2·22
12·8	·02	2·25	·79	7·5	·01	·87	·54
4·6	·10	·64	·25	5·2	·12	·29	·38
11·2	·40	2·25	·73	7·1	·26	1·20	·50
2·3	·03	1·41	·25	1·2	·02	·85	·18
14·6	—	2·57	·82	10·8	—	·81	·67
10·1	·03	1·20	·66	9·0	·02	1·08	·60
17·3	·72	7·64	1·51	10·1	·36	3·78	1·05
60·3	2·59	1·96	3·28	58·0	1·09	·72	2·88
104·9	·37	2·82	3·73	112·5	·30	1·14	3·51
6·6	—	·17	·50	13·5	—	·11	1·48
3·7	·12	·62	·24	2·2	·14	·32	·21
22·3	·01	·76	1·31	28·0	·01	·30	1·91
13·8	·02	2·55	·79	9·9	·01	1·37	·75
26·4	—	·13	1·18	24·1	·01	·07	1·05
48·8	·01	·50	2·08	46·9	—	·21	2·04
1·8	·38	·06	·10	·5	·30	·02	·03
33·0	·34	2·14	3·59	100·0	·33	·84	4·22
3·0	—	1·98	·20	—	—	—	—
·3	·04	·03	·02	·2	·05	—	·01
4·1	—	—	·11	3·7	—	—	·13
—	·04	—	—	—	—	—	·04
667·3	6·89	36·48	35·10	727·6	4·33	17·65	42·50

* These ratios are calculated on the strength including men detached.

ABSTRACT B.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS among the TROOPS stationed in SCOTLAND during the Year 1900, with

Average Strength in Annual Returns, 7,736. Average Strength, including men detached, 8,704. — Diseases.	Admissions into Hospital.	Deaths. With the regiment.	Deaths. Absent from the regiment.	Deaths. Total.	Invalids Discharged the Service.	Average Number constantly Sick.
GENERAL DISEASES.						
Small-pox	—	—	—	—	—	—
Other Eruptive Fevers	57	1	—	1	—	6·58
Influenza	123	1	—	1	—	3·32
Diphtheria	3	—	—	—	—	·29
Enteric Fever	10	2	—	2	—	1·40
Other Continued Fevers	16	1	—	1	—	·20
Cholera	—	—	—	—	—	—
Dysentery	2	—	—	—	—	·17
Yellow Fever	—	—	—	—	—	—
Malarial Fevers	18	—	—	—	—	·57
Septic Diseases	11	—	—	—	—	·58
Tubercular Diseases	21	4	1	5	8	1·94
Syphilis, Primary	93	—	—	—	—	6·22
,, Secondary	76	3	—	3	3	4·84
Gonorrhœa	326	—	—	—	—	15·20
Hydrophobia	—	—	—	—	—	—
Parasitic Diseases	185	—	—	—	—	4·67
Scurvy	1	—	—	—	—	·05
Alcoholism	41	2	—	2	—	1·19
Rheumatism	213	—	—	—	7	10·96
Debility	57	—	—	—	1	2·61
Other General Diseases	12	1	—	1	1	·69
LOCAL DISEASES.						
Diseases of the—						
Nervous System { Nervous	73	3	—	3	12	5·41
Nervous System { Mental	21	—	—	—	6	2·21
Eye	71	—	—	—	4	3·07
Other Organs of Special Sense	20	—	—	—	1	·88
Circulatory System	60	3	—	3	18	3·18
Respiratory ,,	314	15	1	16	12	14·15
Digestive ,,	406	4	—	4	4	11·52
Lymphatic ,,	28	1	—	1	1	1·60
Urinary ,,	19	1	—	1	3	1·36
Generative ,,	100	—	—	—	2	4·68
Organs of Locomotion	59	1	—	1	6	3·32
Connective Tissue	141	—	—	—	—	4·76
Skin	304	—	—	—	2	11·92
INJURIES.						
General	4	4	2	6	—	·28
Local	540	6	—	6	11	23·65
In Action	—	—	—	—	—	—
POISONS	1	—	—	—	—	·02
No appreciable disease	25	—	—	—	—	1·27
Cause unknown (refers to deaths only)	—	—	—	—	—	—
General Total	3,446	53	4	57	102	184·96

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK, the Ratios per 1,000 of the Strength, and the Average Ratios for 10 years.

Ratio per 1,000.				Average Ratio per 1,000 from 1890 to 1899.			
Admissions.	Deaths.*	Invalids finally Discharged.*	Constantly Sick.	Admissions.	Deaths.*	Invalids finally Discharged.*	Constantly Sick.
—	—	—	—	·1	—	—	·01
7·4	·12	—	·85	5·7	—	—	·41
15·9	·12	—	·45	9·9	·08	—	·24
·4	—	—	·04	·1	—	—	·01
1·3	·23	—	·18	·6	·13	—	·08
2·1	·12	—	·03	4·4	—	—	·10
—	—	—	—	·2	—	—	—
·3	—	—	·02	—	—	·03	·02
—	—	—	—	—	—	—	—
2·3	—	—	·07	2·7	—	·08	·08
1·4	—	—	·07	1·6	·10	—	·09
2·7	·87	·92	·25	3·4	·98	1·30	·44
12·0	—	—	·80	25·0	—	—	2·05
9·8	·34	·34	·63	22·1	·05	·85	1·64
42·1	—	—	1·96	64·1	—	·08	3·65
—	—	—	—	—	—	—	—
23·9	—	—	·60	20·3	—	—	·43
·1	—	—	·01	·1	—	·03	·01
5·3	·23	—	·15	1·8	·05	—	·05
27·5	—	·80	1·42	22·7	·08	·77	1·30
7·4	—	·12	·34	5·3	—	·88	·27
1·6	·12	·12	·09	3·6	·16	·16	·18
9·4	·34	1·38	·70	6·9	·32	1·12	·42
2·7	—	·69	·29	1·6	—	·85	·22
9·3	—	·46	·40	8·5	—	·74	·43
2·6	—	·12	·07	5·0	·03	·61	·24
7·8	·34	2·07	·41	7·7	·45	2·92	·59
40·6	1·84	1·38	1·83	50·4	1·17	1·27	2·08
52·5	·46	·46	1·49	84·6	·32	·90	2·14
3·0	·12	·12	·21	7·2	·05	·11	·46
2·5	·13	·34	·18	2·2	·03	·34	·15
12·9	—	·23	·60	28·0	·03	·34	1·44
7·6	·12	·69	·43	10·2	·03	1·25	·53
18·2	—	—	·62	28·0	—	—	·97
39·3	—	·23	1·54	50·7	—	·13	1·85
·5	·69	—	·04	·3	·56	·03	·03
69·8	·69	1·26	3·06	94·7	·48	·90	3·41
—	—	—	—	—	—	—	—
·1	—	—	—	·1	·05	·03	—
3·2	—	—	·16	2·2	·03	—	·05
—	—	—	—	—	—	—	—
445·4	6·55	11·72	19·99	562·0	5·18	15·73	26·07

* These ratios are calculated on the strength including men detached.

ABSTRACT C.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS among the TROOPS stationed in IRELAND during the Year 1900, with

Average Strength in Annual Returns, 26,457. Average Strength, including Men detached, 30,905. Diseases.	Admissions into Hospital.	Deaths. With the regiment.	Deaths. Absent from the regiment.	Deaths. Total.	Discharged the Service. Invalids	Average Number constantly Sick.
GENERAL DISEASES.						
Small-pox	—	—	—	—	—	—
Other Eruptive Fevers	152	2	—	2	—	12·50
Influenza	600	2	—	2	1	18·24
Diphtheria	18	—	1	1	—	1·68
Enteric Fever	47	9	1	10	—	6·64
Other Continued Fevers	45	2	—	2	—	2·65
Cholera	—	—	—	—	—	—
Dysentery	23	—	1	1	1	1·62
Yellow Fever	—	—	—	—	—	—
Malarial Fevers	133	1	—	1	1	5·02
Septic Diseases	30	—	—	—	—	2·03
Tubercular Diseases	98	27	2	29	50	12·64
Syphilis, Primary	557	—	—	—	—	39·35
,, Secondary	360	—	—	—	36	37·83
Gonorrhœa	1,602	—	—	—	—	91·32
Hydrophobia	—	—	—	—	—	—
Parasitic Diseases	793	—	—	—	—	28·28
Scurvy	3	—	—	—	—	·05
Alcoholism	108	7	—	7	—	3·28
Rheumatism	1,060	—	1	1	35	66·83
Debility	325	—	—	—	53	21·55
Other General Diseases	86	4	—	4	9	6·82
LOCAL DISEASES.						
Diseases of the—						
Nervous System { Nervous	293	7	1	8	57	16·84
Nervous System { Mental	87	1	—	1	44	11·22
Eye	398	—	—	—	40	21·56
Other Organs of Special Sense	196	—	—	—	23	11·68
Circulatory System	414	14	—	14	129	32·39
Respiratory ,,	1,746	55	3	58	46	95·79
Digestive ,,	2,503	11	—	11	45	89·92
Lymphatic ,,	184	—	—	—	3	14·18
Urinary ,,	83	3	—	3	25	6·78
Generative ,,	554	—	—	—	20	32·29
Organs of Locomotion	381	—	—	—	75	26·56
Connective Tissue	641	—	—	—	7	28·73
Skin	1,409	—	—	—	3	69·93
INJURIES.						
General	5	8	1	9	2	·35
Local	2,734	11	—	11	53	121·62
In action	17	—	—	—	24	3·29
POISONS	2	—	—	—	—	·21
No appreciable disease	60	—	—	—	—	2·05
Cause unknown (refers to deaths only)	—	—	—	—	—	—
General Total	17,747	164	11	175	782	943·52

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK, the Ratios per 1,000 of the Strength, and the Average ratios for 10 Years.

Ratio per 1,000.				Average Ratio per 1,000 from 1890 to 1899.			
Admissions.	Deaths.*	Invalids finally Discharged.*	Constantly Sick.	Admissions.	Deaths.*	Invalids finally Discharged.*	Constantly Sick.
—	—	—	—	—	—	—	—
5·7	·06	—	·47	5·0	·05	—	·35
22·7	·06	·03	·69	16·4	·05	—	·50
·7	·03	—	·06	·3	·03	—	·03
1·8	·32	—	·25	1·9	·37	—	·34
1·7	·06	—	·10	4·0	·01	—	·16
—	—	—	—	—	—	—	—
·9	·03	·03	·03	·3	—	·03	·02
—	—	—	—	—	—	—	—
5·0	·03	·03	·19	4·3	·01	·03	·16
1·1	—	—	·08	1·1	·03	·01	·09
3·7	·94	1·62	·48	3·3	·73	1·74	·83
21·1	—	—	1·48	39·9	—	—	3·77
13·6	—	1·16	1·43	25·3	·04	·69	2·30
60·6	—	—	3·46	69·4	—	·05	4·97
—	—	—	—	—	—	—	—
30·0	—	—	1·07	22·1	—	—	·71
·1	—	—	—	·1	—	—	—
4·1	·23	—	·12	1·7	·03	·02	·06
40·1	·03	1·13	2·53	27·1	·05	·58	1·73
12·3	—	1·72	·81	7·1	—	·78	·47
3·2	·13	·29	·26	4·3	·11	·24	·29
11·1	·26	1·84	·64	6·3	·20	1·66	·42
3·3	·03	1·42	·42	1·5	·02	1·10	·27
15·0	—	1·29	·82	11·8	—	·64	·74
7·4	—	·74	·44	7·5	—	·94	·53
15·6	·45	4·17	1·22	10·4	·30	3·47	·98
66·0	1·88	1·49	3·62	56·0	·90	·66	2·83
54·6	·36	1·46	3·40	93·3	·26	1·03	3·02
7·0	—	·10	·54	11·1	—	·15	1·16
3·1	·10	·81	·25	2·3	·11	·35	·23
20·9	—	·65	1·22	26·1	—	·28	1·66
14·4	—	2·43	1·00	10·8	·02	1·25	·76
24·2	—	·23	1·09	24·6	—	·06	1·08
53·3	—	·10	2·64	50·1	—	·24	2·25
·2	·19	·06	·01	·3	·38	·61	·02
103·3	·36	1·72	4·60	108·9	·31	·68	4·49
·6	—	·78	·12	—	—	—	—
·1	—	—	·01	·1	·03	·01	·01
2·3	—	—	·08	2·4	—	—	·08
—	—	—	—	—	—	—	—
670·3	5·66	25·30	35·66	657·1	4·04	16·10	37·21

* These ratios are calculated on the strength including men detached.

ABSTRACT No. II.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the TROOPS stationed at GIBRALTAR during the year 1900, with the Ratios

Average Strength, 4,858. Diseases.	Admissions into Hospital.	Deaths. In the Command	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent Home.	Invalids. Number finally Discharged the Service.	Average number constantly sick.
GENERAL DISEASES.							
Small-pox	4	—	—	—	—	—	·31
Other Eruptive Fevers	12	—	—	—	—	—	1·52
Influenza	5	—	—	—	—	—	·27
Diphtheria	—	—	—	—	—	—	—
Enteric Fever	21	7	—	7	—	—	2·57
Other Continued Fevers	43	1	—	1	2	1	3·53
Cholera	—	—	—	—	—	—	—
Dysentery	2	—	—	—	—	—	·15
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	5	—	—	—	—	—	·17
Septic Diseases	2	1	—	1	—	—	·08
Tubercular Diseases	10	2	—	2	6	6	·86
Syphilis, Primary	19	—	—	—	—	—	2·15
,, Secondary	61	—	—	—	7	3	8·23
Gonorrhœa	533	—	—	—	—	—	45·10
Hydrophobia	—	—	—	—	—	—	—
Parasitic diseases	10	—	—	—	—	—	2·36
Scurvy	—	—	—	—	—	—	—
Alcoholism	36	1	—	1	—	—	1·20
Rheumatism	76	—	—	—	8	2	5·15
Debility	38	—	—	—	12	3	3·63
Other General Diseases	20	—	—	—	—	—	·90
LOCAL DISEASES.							
Diseases of the—							
Nervous System { Nervous	25	1	—	1	8	6	3·10
Nervous System { Mental	6	1	—	1	6	8	·61
Eye	44	—	—	—	10	7	4·02
Other Organs of Special Sense	24	—	—	—	—	2	1·77
Circulatory System	37	—	—	—	14	7	5·03
Respiratory ,,	124	2	—	2	8	3	9·33
Digestive ,,	380	2	—	2	5	—	11·78
Lymphatic ,,	48	—	—	—	2	1	4·93
Urinary ,,	10	—	—	—	3	3	1·27
Generative ,,	298	—	—	—	—	—	24·52
Organs of Locomotion	43	—	—	—	8	4	3·36
Connective Tissue	123	—	—	—	1	1	6·12
Skin	139	—	—	—	—	—	8·93
INJURIES.							
General	7	—	—	—	—	1	·13
Local	271	5	—	5	2	2	15·16
In Action	—	—	—	—	—	—	—
POISONS	1	—	1	1	—	—	·07
No appreciable disease	33	—	—	—	—	—	·92
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	2,573	23	1	24	102	69	180·37

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among per 1,000 of the Strength, and the Average Ratios for 10 years.

Ratio per 1,000.					Average Ratio per 1,000 from 1890 to 1899.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
·8	—	—	—	·06	—	—	—	—	—
2·5	—	—	—	·31	1·0	—	—	—	·12
1·0	—	—	—	·06	21·0	—	—	—	·40
—	—	—	—	—	·1	—	—	—	·01
4·3	1·44	—	—	·53	3·6	·89	·49	—	·66
8·9	·21	·41	·21	·73	19·0	·09	·72	·11	1·84
—	—	—	—	—	—	—	—	—	—
·4	—	—	—	·03	·4	·2	—	—	·03
—	—	—	—	—	—	—	—	—	—
1·0	—	—	—	·03	7·6	—	·06	·02	·27
·4	·21	—	—	·02	·7	·04	—	—	·04
2·1	·41	1·23	1·23	·18	1·9	·51	1·40	1·28	·36
3·9	—	—	—	·42	20·9	—	—	·02	2·32
12·6	—	1·44	·62	1·69	23·0	·04	·83	·36	2·75
109·7	—	—	—	9·28	129·7	—	·15	·04	10·76
—	—	—	—	—	—	·02	—	—	—
11·4	—	—	—	·49	13·2	—	—	—	·46
—	—	—	—	—	—	—	—	—	—
7·4	·21	—	—	·37	6·2	·09	·04	—	·25
15·7	—	1·65	·41	1·20	26·1	·02	·64	·15	1·64
7·8	—	2·47	·62	·75	4·8	·02	·85	·47	·40
4·1	—	—	—	·19	7·1	·09	·36	·19	·57
5·2	·21	1·65	1·23	·62	9·3	·17	1·13	·91	·58
1·2	·21	1·23	1·65	·13	1·2	·04	1·17	1·17	·34
9·1	—	2·06	1·44	·83	9·7	—	·79	·62	·82
4·9	—	—	·41	·36	9·6	—	·81	·55	·66
7·6	—	2·88	1·44	1·04	5·1	·32	1·34	1·15	·54
25·5	·41	1·65	·62	1·92	26·3	·36	·83	·36	1·64
78·2	·41	1·03	—	2·42	93·4	·28	·70	·38	2·86
9·9	—	·41	·21	1·01	16·5	—	·45	·26	2·18
2·1	—	·62	·62	·26	2·3	·09	·23	·15	·23
61·3	—	—	—	5·05	99·7	·02	·15	·11	9·05
8·9	—	1·65	·82	·70	8·2	·04	·64	·53	·66
25·3	—	·21	·21	1·26	25·3	—	·15	·06	1·22
28·6	—	—	—	1·84	42·1	—	·13	·06	2·07
1·4	—	—	—	·03	·3	·28	·08	·09	·05
56·4	1·03	41	·41	3·12	102·9	·42	·45	·40	4·61
—	—	—	—	—	—	—	—	—	—
·2	·21	—	—	·01	—	—	—	—	—
6·8	—	—	—	·19	3·7	—	—	—	·17
—	—	—	—	—	—	—	—	—	—
529·6	4·94	21·00	12·15	37·13	741·9	3·83	14·41	9·44	50·52

ABSTRACT No. IIIA.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the ROYAL MALTA Artillery stationed at MALTA during the year 1900, with

Average Strength, 814. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Numbers Sent Home.	Invalids. Number finally Discharged the Service.	Average Number constantly sick.
GENERAL DISEASES.							
Small Pox	—	—	—	—	—	—	—
Other Eruptive Fevers	—	—	—	—	—	—	—
Influenza	14	—	—	—	—	—	·42
Diphtheria	—	—	—	—	—	—	—
Enteric Fever	—	—	—	—	—	—	—
Other Continued Fevers	20	—	—	—	—	—	·81
Cholera	—	—	—	—	—	—	—
Dysentery	—	—	—	—	—	—	—
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	—	—	—	—	—	—	—
Septic Diseases	—	—	—	—	—	—	—
Tubercular Diseases	4	2	—	2	—	2	·49
Syphilis, Primary	3	—	—	—	—	—	·18
,, Secondary	2	—	—	—	—	—	·12
Gonorrhœa	6	—	—	—	—	—	·46
Hydrophobia	—	—	—	—	—	—	—
Parasitic Diseases	—	—	—	—	—	—	—
Scurvy	—	—	—	—	—	—	—
Alcoholism	—	—	—	—	—	—	—
Rheumatism	3	—	—	—	—	—	·32
Debility	12	—	—	—	—	1	·40
Other General Diseases	4	—	—	—	—	—	·27
LOCAL DISEASES.							
Diseases of the—							
Nervous System { Nervous	1	—	—	—	—	—	·24
Nervous System { Mental	1	—	—	—	—	1	·08
Eye	8	—	—	—	—	1	·46
Other Organs of Special Sense	6	—	—	—	—	—	·16
Circulatory System	1	—	—	—	—	1	·11
Respiratory ,,	19	—	—	—	—	—	·54
Digestive ,,	35	—	—	—	—	—	·87
Lymphatic ,,	1	—	—	—	—	—	·04
Urinary ,,	—	—	—	—	—	—	—
Generative ,,	4	—	—	—	—	—	·10
Organs of Locomotive	2	—	—	—	—	1	·15
Connective Tissue	14	—	—	—	—	—	·81
Skin	34	—	—	—	—	—	1·66
INJURIES.							
General	—	—	—	—	—	—	—
Local	53	—	—	—	—	1	2·41
In Action	—	—	—	—	—	—	—
POISONS	—	—	—	—	—	—	—
No appreciable disease	—	—	—	—	—	—	—
Cause unknown (refers to death only)	—	—	—	—	—	—	—
General Total	247	2	—	2	—	8	11·10

into HOSPITALS, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK, among per 1,000 of the Strength and the Average Ratios for 10 years.

Ratio per 1,000.					Average Ratio per 1,000 from 1890 to 1899.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
·1	--	—	—	·01	·1	·01	—	—	·01
·3	—	—	—	·06	·4	·01	—	—	·04
·2	—	—	—	·61	4·3	—	·01	—	·13
—	—	—	—	—	·1	·03	—	—	—
3·6	1·26	·23	—	·69	8·7	3·04	1·54	·03	1·45
156·2	·92	5·61	·23	7·83	165·4	1·23	8·55	·62	10·27
—	—	—	—	—	—	—	—	—	—
3·6	—	·23	—	·31	6·6	·28	·21	·06	·52
—	—	—	—	—	—	—	—	—	—
23·9	·11	·69	—	1·07	38·8	·11	·96	·07	1·45
·3	·11	—	—	·02	·7	·11	—	·01	·06
4·0	·57	2·40	·80	·86	2·5	·90	1·49	1·31	·40
6·0	—	—	—	·53	24·4	—	—	—	2·54
12·9	—	·11	—	1·44	17·3	·07	·70	·38	1·92
69·7	—	·23	—	5·14	83·7	—	·12	·06	6·41
—	—	—	—	—	—	—	—	—	—
14·3	—	—	—	·66	12·0	01	·01	—	·37
—	—	—	—	—	—	—	—	—	—
3·9	·11	·23	—	·19	2·5	·03	—	—	·10
29·9	·11	1·15	—	1·99	22·5	·09	·78	·30	1·67
9·7	—	1·15	—	·89	8·9	—	1·02	·75	·78
6·9	—	·46	·23	·58	6·2	·09	·17	·11	·42
11·9	·34	1·49	·92	·65	6·0	·16	·83	·78	·39
2·5	—	1·60	1·83	·59	1·7	—	1·64	1·66	·43
16·5	—	·69	·69	·89	10·2	—	·49	·33	·63
13·9	—	1·60	·46	·92	11·9	—	·89	·75	·74
11·7	·57	4·35	1·60	1·62	6·1	·23	1·89	1·81	·70
36·3	·11	·34	·11	2·08	20·4	·53	·97	·44	1·46
171·9	·34	1·03	·11	5·08	87·9	·58	·68	·28	2·99
5·4	—	·11	—	·48	8·8	—	·06	·06	1·00
1·4	—	—	—	·15	1·7	·10	·46	·32	·18
49·9	—	·69	—	3·46	40·3	·01	·24	·22	2·74
12·5	—	·69	·46	·85	7·1	·03	·57	·54	·53
42·7	—	·11	—	1·65	31·0	—	·01	—	1·27
77·8	—	·23	—	3·22	47·4	—	·11	·09	2·23
1·0	1·26	—	—	·02	·9	·72	·05	·04	·07
107·1	·34	·80	·34	4·56	89·7	·55	·76	·40	4·03
—	—	—	—	—	—	—	—	·16	—
·1	—	—	—	·00	·3	·05	·01	—	·01
14·0	—	—	—	·48	4·5	—	—	—	·19
—	—	—	—	—	—	—	—	—	—
922·1	6·18	26·22	7·79	48·98	781·0	8·97	25·25	11·57	48·83

ABSTRACT No. IIIA.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the ROYAL MALTA Artillery stationed at MALTA during the year 1900, with

Average Strength, 814. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Numbers Sent Home.	Invalids. Number finally Discharged the Service.	Average Number constantly sick.
GENERAL DISEASES.							
Small Pox	—	—	—	—	—	—	—
Other Eruptive Fevers	—	—	—	—	—	—	—
Influenza	14	—	—	—	—	—	·42
Diphtheria	—	—	—	—	—	—	—
Enteric Fever	—	—	—	—	—	—	—
Other Continued Fevers	20	—	—	—	—	—	·81
Cholera	—	—	—	—	—	—	—
Dysentery	—	—	—	—	—	—	—
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	—	—	—	—	—	—	—
Septic Diseases	—	—	—	—	—	—	—
Tubercular Diseases	4	2	—	2	—	2	·49
Syphilis, Primary	3	—	—	—	—	—	·15
,, Secondary	2	—	—	—	—	—	·12
Gonorrhœa	6	—	—	—	—	—	·46
Hydrophobia	—	—	—	—	—	—	—
Parasitic Diseases	—	—	—	—	—	—	—
Scurvy	—	—	—	—	—	—	—
Alcoholism	—	—	—	—	—	—	—
Rheumatism	3	—	—	—	—	—	·32
Debility	12	—	—	—	—	1	·40
Other General Diseases	4	—	—	—	—	—	·27
LOCAL DISEASES.							
Diseases of the—							
Nervous System { Nervous	1	—	—	—	—	—	·24
Nervous System { Mental	1	—	—	—	—	1	·08
Eye	8	—	—	—	—	1	·46
Other Organs of Special Sense	6	—	—	—	—	—	·16
Circulatory System	1	—	—	—	—	1	·11
Respiratory ,,	19	—	—	—	—	—	·34
Digestive ,,	35	—	—	—	—	—	·87
Lymphatic ,,	1	—	—	—	—	—	·04
Urinary ,,	—	—	—	—	—	—	—
Generative ,,	4	—	—	—	—	—	·10
Organs of Locomotive	2	—	—	—	—	1	·15
Connective Tissue	14	—	—	—	—	—	·81
Skin	34	—	—	—	—	—	1·06
INJURIES.							
General	—	—	—	—	—	—	—
Local	53	—	—	—	—	1	2·41
In Action	—	—	—	—	—	—	—
POISONS	—	—	—	—	—	—	—
No appreciable disease	—	—	—	—	—	—	—
Cause unknown (refers to death only)	—	—	—	—	—	—	—
General Total	247	2	—	2	—	8	11·10

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the Ratios per 1,000 of the Strength, and the Average Ratios for 10 years.

Ratio per 1,000.					Average Ratio per 1,000 from 1890 to 1899.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·8	—	—	—	·02
17·2	—	—	—	·52	7·0	—	—	—	·20
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·8	·21	—	—	·14
24·6	—	—	—	1·00	59·4	—	—	—	2·18
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	1·0	—	—	—	·11
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·4	—	—	—	·01
—	—	—	—	—	·6	—	—	—	·03
4·9	2·46	—	2·46	·60	3·3	·62	—	1·65	·34
3·7	—	—	—	·22	9·5	—	—	—	·78
2·5	—	—	—	·15	6·0	—	—	—	·39
7·4	—	—	—	·57	22·5	—	—	—	1·63
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	4·1	—	—	—	·13
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·8	—	—	—	·08
3·7	—	—	—	·39	22·5	—	—	·62	·84
14·7	—	—	1·23	·49	14·9	—	—	1·86	·81
4·9	—	—	—	·33	1·5	—	—	—	·09
1·2	—	—	—	·29	4·1	·21	—	·41	·18
1·2	—	—	1·23	·10	2·5	—	—	1·86	·21
9·8	—	—	1·23	·57	21·3	—	—	1·03	1·20
7·4	—	—	—	·20	4·5	—	—	·21	·18
1·2	—	—	1·23	·14	2·5	·62	—	·62	·20
23·3	—	—	—	·66	47·5	·21	—	—	1·94
43·0	—	—	—	1·07	55·9	·41	—	1·44	1·66
1·2	—	—	—	·05	·6	—	—	—	·03
—	—	—	—	—	·8	—	—	·21	·05
4·9	—	—	—	·12	8·3	—	—	·21	·37
2·5	—	—	1·23	·18	2·7	—	—	1·65	·20
17·2	—	—	—	1·00	11·1	—	—	—	·50
41·8	—	—	—	2·04	59·0	—	—	·41	2·14
—	—	—	—	—	—	—	—	—	—
65·1	—	—	1·23	2·96	101·3	·21	—	·41	3·10
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	·21	—	—	—
—	—	—	—	—	1·7	—	—	—	·09
—	—	—	—	—	—	—	—	—	—
303·4	2·46	—	9·83	13·64	478·9	2·68	—	12·39	19·83

ABSTRACT No. V.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the EUROPEAN TROOPS stationed at BERMUDA during the Year 1900, with

Average Strength, 632. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent Home.	Invalids. Number finally Discharged the Service.	Average Number constantly Sick.
GENERAL DISEASES.							
Small-pox	—	—	—	—	—	—	—
Other Eruptive Fevers	—	—	—	—	—	—	—
Influenza	2	—	—	—	—	—	·04
Diphtheria	—	—	—	—	—	—	—
Enteric Fever	7	—	—	—	—	—	1·41
Other Continued Fevers	11	—	—	—	—	—	·40
Cholera	—	—	—	—	—	—	—
Dysentery	5	1	—	1	—	—	·36
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	—	—	—	—	—	—	—
Septic Diseases	—	—	—	—	—	—	—
Tubercular Diseases	—	—	—	—	—	2	··
Syphilis, Primary	4	—	—	—	—	—	·16
,, Secondary	2	—	—	—	—	—	·11
Gonorrhœa	20	—	—	—	—	—	1·19
Hydrophobia	—	—	—	—	—	—	—
Parasitic Diseases	11	—	—	—	—	—	·22
Scurvy	—	—	—	—	—	—	—
Alcoholism	2	—	—	—	—	—	·13
Rheumatism	10	—	—	—	—	—	·52
Debility	12	—	—	—	2	1	1·08
Other General Diseases	—	—	—	—	—	—	—
LOCAL DISEASES.							
Diseases of the—							
Nervous System { Nervous	8	—	—	—	1	2	·47
Nervous System { Mental	1	—	—	—	1	2	·10
Eye	1	—	—	—	—	1	·01
Other Organs of Special Sense	1	—	—	—	—	2	·17
Circulatory System	8	—	—	—	1	1	·47
Respiratory ,,	6	—	—	—	—	1	·34
Digestive ,,	37	—	—	—	—	1	·94
Lymphatic ,,	3	—	—	—	—	1	·16
Urinary ,,	2	—	—	—	—	1	·09
Generative ,,	6	—	—	—	1	—	·34
Organs of Locomotion	2	—	—	—	—	—	·03
Connective Tissue	12	—	—	—	—	—	·53
Skin	10	—	—	—	—	—	·45
INJURIES.							
General	1	2	—	2	—	—	·05
Local	49	—	—	—	—	1	1·87
In Action	—	—	—	—	—	—	—
POISONS	1	—	—	—	—	—	·01
No appreciable disease	1	—	—	—	—	—	·02
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	233	3	—	3	6	12	11·87

INTO HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK, among Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.					Average Ratio per 1,000 from 1890 to 1899.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
17·0	—	—	—	·89	4·5	·14	—	—	·35
124·4	—	—	—	1·88	16·7	—	—	—	·45
—	—	—	—	—	—	—	—	—	—
1·7	—	—	—	·29	·5	·14	—	—	·06
4·0	—	—	—	·13	1·4	—	—	—	·06
—	—	—	—	—	—	—	—	—	—
·6	—	—	—	·02	·1	—	—	—	·01
—	—	—	—	—	—	—	—	—	—
2·3	—	—	—	·07	1·3	—	—	—	·05
1·1	—	—	—	·29	1·8	·14	·07	—	·14
1·1	—	·57	1·13	·20	2·9	·81	1·97	1·49	·32
18·1	—	—	—	1·99	25·1	—	—	—	1·71
14·1	·57	·57	—	1·84	16·6	—	·61	·07	1·38
140·8	—	—	—	5·10	58·2	—	—	—	2·26
—	—	—	—	—	—	—	—	—	—
4·5	—	—	—	·23	11·6	—	—	—	·29
—	—	—	—	—	—	—	—	—	—
9·1	—	—	—	·23	3·4	—	—	—	·11
35·1	—	—	·57	1·81	27·2	—	·75	·20	1·54
·6	—	—	—	·06	2·0	—	·68	·41	·12
9·1	·57	—	—	·31	7·9	—	·41	·14	·28
10·2	·57	·57	·57	·53	7·5	·41	1·15	1·29	·35
1·1	—	·57	1·13	·22	·9	—	·88	·82	·15
9·1	—	—	—	·19	9·1	—	·75	·54	·39
9·6	—	—	—	·17	5·9	·07	·34	·07	·23
5·1	·57	2·26	1·70	·55	6·7	·47	1·70	1·56	·51
64·5	1·70	1·70	·57	2·47	31·2	·54	1·02	·82	1·51
145·9	·57	—	—	3·68	78·0	·14	·20	·14	1·96
4·5	—	—	—	·39	17·1	—	·14	·07	1·62
5·1	·57	·57	—	·31	2·2	·20	·61	·34	·18
33·9	—	—	—	1·43	22·7	—	·14	·07	·98
14·1	—	·57	—	·44	9·6	—	1·09	1·02	·69
24·3	—	—	—	·79	21·9	—	—	—	·88
54·3	—	—	—	1·96	32·3	—	·27	·27	1·28
1·1	1·13	—	—	·02	·3	·54	—	—	·02
158·4	·57	·57	·57	6·43	96·9	—	·68	·82	3·92
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·2	·07	—	—	—
1·7	—	—	—	·05	1·4	—	—	—	·07
—	—	—	—	—	—	—	—	—	—
926·5	6·79	7·92	6·22	34·97	525·1	3·67	13·46	10·13	23·87

ABSTRACT No. V.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the EUROPEAN TROOPS stationed at BERMUDA during the Year 1900, with

Average Strength, 632. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent Home.	Invalids. Number finally Discharged the Service.	Average Number constantly Sick.
GENERAL DISEASES.							
Small-pox	—	—	—	—	—	—	—
Other Eruptive Fevers	—	—	—	—	—	—	—
Influenza	2	—	—	—	—	—	·04
Diphtheria	—	—	—	—	—	—	—
Enteric Fever	7	—	—	—	—	—	1·41
Other Continued Fevers	11	—	—	—	—	—	·40
Cholera	—	—	—	—	—	—	—
Dysentery	5	1	—	1	—	—	·36
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	—	—	—	—	—	—	—
Septic Diseases	—	—	—	—	—	—	—
Tubercular Diseases	—	—	—	—	—	2	··
Syphilis, Primary	4	—	—	—	—	—	·16
,, Secondary	2	—	—	—	—	—	·11
Gonorrhœa	29	—	—	—	—	—	1·09
Hydrophobia	—	—	—	—	—	—	—
Parasitic Diseases	11	—	—	—	—	—	·22
Scurvy	—	—	—	—	—	—	—
Alcoholism	2	—	—	—	—	—	·13
Rheumatism	10	—	—	—	—	—	·32
Debility	12	—	—	—	2	1	1·08
Other General Diseases	—	—	—	—	—	—	—
LOCAL DISEASES.							
Diseases of the—							
Nervous System { Nervous	5	—	—	—	1	2	·47
Nervous System { Mental	1	—	—	—	1	2	·10
Eye	1	—	—	—	—	1	·01
Other Organs of Special Sense	1	—	—	—	—	2	·17
Circulatory System	2	—	—	—	1	1	·11
Respiratory ,,	6	—	—	—	—	—	·34
Digestive ,,	37	—	—	—	—	—	·91
Lymphatic ,,	2	—	—	—	—	—	·16
Urinary ,,	3	—	—	—	—	—	·09
Generative ,,	12	—	—	—	1	—	·34
Organs of Locomotion	12	—	—	—	—	—	·23
Connective Tissue	12	—	—	—	—	—	·23
Skin	10	—	—	—	—	—	·45
INJURIES.							
General	1	—	—	—	—	—	·06
Local	45	—	—	2	—	1	1·47
In Action	—	—	—	—	—	—	—
POISONS	1	—	—	—	—	—	·01
No appreciable disease	1	—	—	—	—	—	·02
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	233	3	—	3	6	12	11·67

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the Ratios per 1,000 of the Strength, and the average Ratios for 10 Years.

Ratio per 1,000.					Average Ratio per 1,000 from 1890 to 1899.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
3·2	—	—	—	·06	11·5	—	—	—	·30
—	—	—	—	—	—	—	—	—	—
11·1	—	—	—	2·23	25·8	4·64	—	—	4·07
17·4	—	—	—	·63	21·1	—	—	—	·39
—	—	—	—	—	—	—	—	—	—
7·9	1·58	—	—	·57	2·1	·20	·07	·07	·17
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	2·1	·07	—	—	·09
—	—	—	—	—	·3	·13	—	—	·01
—	—	—	3·16	—	2·1	·79	1·13	·96	·82
6·3	—	—	—	·25	7·9	—	—	—	·71
3·2	—	—	—	·17	14·2	—	1·19	·96	1·89
31·6	—	—	—	1·88	19·2	—	·07	—	1·48
—	—	—	—	—	—	—	—	—	—
17·4	—	—	—	·35	11·2	—	—	—	·28
—	—	—	—	—	—	—	—	—	—
3·2	—	—	—	·21	7·8	—	—	—	·25
15·8	—	—	—	·82	16·0	—	·23	—	·62
19·0	—	3·16	1·58	1·71	7·7	—	1·06	·33	·47
—	—	—	—	—	4·7	—	·13	—	·25
12·6	—	1·58	3·16	·74	6·0	·46	·79	·40	·38
—	—	1·58	3·16	·16	1·4	—	1·13	1·19	·46
1·6	—	—	1·58	·02	10·5	—	·40	·26	·45
1·6	—	—	3·16	·27	10·2	—	·80	·80	·44
12·6	—	1·58	1·58	·74	4·7	·27	·99	·66	·52
9·5	—	—	—	·54	20·8	·60	1·06	·80	1·26
58·5	—	—	—	1·49	88·0	·33	·93	·26	2·44
3·2	—	—	—	·25	6·9	—	·13	·07	·32
3·2	—	—	—	·14	2·1	·13	·33	·13	·21
9·5	—	1·58	—	·54	11·9	—	·20	—	·64
3·2	—	—	—	·05	8·9	·07	·66	·40	·61
19·0	—	—	—	·84	35·9	—	·07	—	1·26
15·8	—	—	—	·71	37·0	—	—	—	1·32
1·6	3·16	—	—	·08	·8	·33	—	—	·05
77·5	—	—	1·58	2·96	102·7	·33	·86	·40	4·23
—	—	—	—	—	—	—	—	—	—
1·6	—	—	—	·02	·3	—	—	—	·02
1·6	—	—	—	·03	1·9	—	—	—	·05
—	—	—	—	—	—	—	—	—	—
383·7	4·75	9·49	18·99	18·46	503·7	8·35	12·39	7·09	27·10

ABSTRACT No. VI.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the NON-EUROPEAN TROOPS stationed at BERMUDA during the Year 1900,

Average Strength, 775. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent to W. Indies	Invalids. Number finally Discharged the Service.	Average Number constantly Sick.
GENERAL DISEASES.							
Small-pox	—	—	—	—	—	—	—
Other Eruptive Fevers	—	—	—	—	—	—	—
Influenza	4	—	—	—	—	—	·14
Diphtheria	—	—	—	—	—	—	—
Enteric Fever	—	—	—	—	—	—	—
Other Continued Fevers	—	—	—	—	—	—	—
Cholera	—	—	—	—	—	—	—
Dysentery	1	—	—	—	—	—	·03
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	51	—	—	—	3	1	2·57
Septic Disease	—	—	—	—	—	—	—
Tubercular Diseases	14	6	—	6	7	9	1·71
Syphilis, Primary	11	—	—	—	—	—	2·10
,, Secondary	22	—	—	—	8	4	3·94
Gonorrhœa	34	—	—	—	—	—	2·71
Hydrophobia	—	—	—	—	—	—	—
Parasitic Diseases	31	—	—	—	—	—	·69
Scurvy	—	—	—	—	—	—	—
Alcoholism	—	—	—	—	—	—	—
Rheumatism	24	—	—	—	3	1	1·73
Debility	11	—	—	—	3	—	1·01
Other General Diseases	1	—	—	—	—	—	·04
LOCAL DISEASES.							
Diseases of the—							
Nervous System { Nervous	3	—	—	—	1	—	·15
Nervous System { Mental	—	—	—	—	—	—	—
Eye	17	—	—	—	—	—	1·23
Other Organs of Special Sense	5	—	—	—	1	—	·29
Circulatory System	37	6	—	6	14	8	3·72
Respiratory	47	2	—	2	2	—	2·27
Digestive	26	2	—	2	—	—	·79
Lymphatic	6	—	—	—	1	—	1·53
Urinary	7	—	—	—	2	—	·65
Generative	18	—	—	—	2	—	1·62
Organs of Locomotion	8	—	—	—	1	—	·69
Connective Tissue	11	—	—	—	—	—	·51
Skin	16	—	—	—	1	1	1·09
INJURIES.							
General	—	1	—	1	—	—	—
Local	20	—	—	—	—	—	·75
In Action	—	—	—	—	—	—	—
POISONS.							
No appreciable disease	—	—	—	—	—	—	—
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	425	17	—	17	49	24	31·96

* Non-European Troops have not

into HOSPITAL, DEATHS, NUMBERS INVALIDED AND CONSTANTLY SICK among with the Ratios per 1,000 of the Strength, and the average Ratios for 10 Years.

Ratio per 1,000.					*Average Ratio per 1,000 from 18— to 18—.				
Admissions.	Deaths.	Invalids sent to W. Indies.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent to West Indies.	Invalids finally Discharged.	Constantly sick.
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
5·2	—	—	—	·18	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
1·3	—	—	—	·04	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
65·8	—	3·87	1·29	3·32	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
16·1	7·74	9·03	11·61	2·21	—	—	—	—	—
14·2	—	—	—	2·71	—	—	—	—	—
28·4	—	10·32	5·16	5·08	—	—	—	—	—
43·9	—	—	—	3·50	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
40·0	—	—	—	·89	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
31·0	—	3·87	1·29	2·23	—	—	—	—	—
14·2	—	3·87	—	1·30	—	—	—	—	—
1·3	—	—	—	·05	—	—	—	—	—
3·9	—	1·29	—	·19	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
21·9	—	—	—	1·59	—	—	—	—	—
6·5	—	1·29	—	·37	—	—	—	—	—
47·7	7·74	18·07	10·32	4·80	—	—	—	—	—
60·6	2·58	2·58	—	2·93	—	—	—	—	—
33·6	2·58	—	—	1·02	—	—	—	—	—
7·7	—	1·29	—	1·97	—	—	—	—	—
9·0	—	2·58	—	·84	—	—	—	—	—
23·2	—	2·58	—	2·69	—	—	—	—	—
10·3	—	1·29	—	·89	—	—	—	—	—
14·2	—	—	—	·66	—	—	—	—	—
20·6	—	1·29	1·29	1·41	—	—	—	—	—
—	1·29	—	—	—	—	—	—	—	—
25·8	—	—	—	·97	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
548·4	21·93	63·22	30·96	41·24	—	—	—	—	—

hitherto been stationed at Bermuda.

ABSTRACT No. VII.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the EUROPEAN TROOPS stationed at BARBADOS during the Year 1900, with

Average Strength, 714. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent Home.	Invalids. Number finally Discharged the Service.	Average Number constantly Sick.
GENERAL DISEASES.							
Small-pox	—	—	—	—	—	—	—
Other Eruptive Fevers	—	—	—	—	—	—	—
Influenza	12	—	—	—	—	—	·29
Diphtheria	—	—	—	—	—	—	—
Enteric Fever	1	1	—	1	—	—	·03
Other Continued Fevers	22	—	—	—	—	—	1·00
Cholera	—	—	—	—	—	—	—
Dysentery	1	—	—	—	—	—	·00
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	16	—	—	—	—	—	·26
Septic Diseases	—	—	—	—	—	—	—
Tubercular Diseases	7	1	—	1	3	1	·03
Syphilis, Primary	62	—	—	—	—	—	·17
" Secondary	51	—	1	1	3	—	6·33
Gonorrhœa	64	—	—	—	—	—	4·47
Hydrophobia	—	—	—	—	—	—	—
Parasitic Diseases	6	—	—	—	—	—	·15
Scurvy	—	—	—	—	—	—	—
Alcoholism	14	—	—	—	—	—	·35
Rheumatism	19	—	—	—	1	—	1·23
Debility	14	—	—	—	—	—	1·10
Other General Diseases	3	—	1	1	1	—	·05
LOCAL DISEASES.							
Diseases of the—							
Nervous System (Nervous)	1	—	—	—	1	—	·11
Nervous System (Mental)		—	—	—			
Eye		—	—	—			
Other Organs of Special Sense		—	—	—			
Circulatory System		—	—	—			
Respiratory	13	1	—	1	2	—	1
Digestive	56	1	—	1			1
Lymphatic	36	—	—	—			6
Urinary	1	—	—	—	1	1	
Generative	17	—	—	—			
Organs of Locomotion	5	1	—	1			
Connective Tissue	7	—	—	—			
Skin	23	—	—	—	—	—	
INJURIES.							
General	—	—	—	—	—	—	—
Local	52	—	—	—	1	—	·06
Ill Assorted	—	—	—	—	—	—	—
PYÆMIA	—	—	—	—	—	—	—
No appreciable disease	—	—	—	—	—	—	—
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	387	3	2	5	24	2	18·71

INTO HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK, among Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.					Average Ratio per 1,000 from 1890 to 1899.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	6·3	—	—	—	·35
16·8	—	—	—	·55	15·1	—	—	—	·49
—	—	—	—	—	·1	·14	—	—	—
1·4	1·40	—	—	·04	2·7	1·08	·27	—	·45
30·8	—	—	—	1·40	98·4	—	—	—	3·29
—	—	—	—	—	—	—	—	—	—
1·4	—	—	—	·11	2·7	·40	·27	—	·29
—	—	—	—	—	1·5	·67	—	—	·08
22·4	—	—	—	·50	77·5	1·48	1·21	·40	3·19
—	—	—	—	—	·1	—	—	—	—
9·8	1·40	4·20	1·40	·60	2·0	·54	1·48	1·35	·48
114·9	—	—	—	10·41	79·0	—	—	—	7·87
71·4	1·40	4·20	—	8·73	65·4	—	3·64	1·48	7·73
89·7	—	—	—	9·26	189·9	—	·14	—	15·02
—	—	—	—	—	—	—	—	—	—
8·4	—	—	—	·35	19·6	—	—	—	·68
—	—	—	—	—	—	—	—	—	—
19·6	—	—	—	·50	13·2	·27	—	—	·33
26·6	—	1·40	—	1·72	50·7	—	1·35	·54	3·00
19·6	—	—	—	1·54	19·4	—	2·56	·81	1·30
4·2	1·40	1·40	—	·63	13·3	·54	·94	·54	·92
—	—	—	—	—	13·9	·14	1·89	1·35	1·09
1·4	—	1·40	4·20	·15	·9	—	·94	1·21	·21
2·8	—	—	—	·06	13·3	—	1·35	1·62	·83
16·8	—	—	—	·83	27·1	—	2·16	1·21	1·47
9·8	—	4·20	2·80	·71	10·4	·27	2·43	2·02	1·15
18·2	1·40	—	—	1·58	22·6	·54	·67	·54	1·33
81·2	1·40	—	—	2·79	107·8	·40	·94	·40	3·52
50·4	—	—	—	8·73	56·5	—	1·08	·40	6·91
1·4	—	1·40	1·40	·10	2·4	·40	·14	—	·19
23·8	—	—	—	1·24	146·1	—	·14	—	10·93
7·0	1·40	—	—	·52	13·5	—	·67	·54	·93
26·6	—	—	—	·99	46·1	—	—	—	1·91
46·2	—	—	—	3·19	66·8	—	·14	—	2·88
—	—	—	—	—	·3	·40	—	—	·01
113·5	—	1·40	—	4·22	132·2	·40	·54	·14	4·98
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·5	·14	—	—	—
—	—	—	—	—	4·6	—	—	—	·00
—	—	—	—	—	—	—	—	—	—
836·1	9·80	19·61	9·80	58·45	1321·9	7·82	24·93	14·55	83·90

ABSTRACT No. VIII.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the NON-EUROPEAN TROOPS stationed at BARBADOS during the year 1900,

Average Strength, 484. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent home.	Invalids. Number finally Discharged the Service.	Average Number constantly Sick.
GENERAL DISEASES.							
Small-pox	—	—	—	—	—	—	—
Other Eruptive Fevers	—	—	—	—	—	—	—
Influenza	28	—	—	—	—	—	·76
Diphtheria	—	—	—	—	—	—	—
Enteric Fever	—	—	—	—	—	—	—
Other Continued Fevers	22	—	—	—	—	—	·74
Cholera	—	—	—	—	—	—	—
Dysentery	1	—	—	—	—	—	·14
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	41	—	—	—	—	1	1·88
Septic Diseases	—	—	—	—	—	—	—
Tubercular Diseases	7	1	—	1	—	5	·83
Syphilis, Primary	64	—	—	—	—	—	5·83
,, Secondary	42	—	—	—	—	21	4·67
Gonorrhœa	38	—	—	—	—	—	2·49
Hydrophobia	—	—	—	—	—	—	—
Parasitic Diseases	5	—	—	—	—	—	·37
Scurvy	—	—	—	—	—	—	—
Alcoholism	1	—	—	—	—	—	·09
Rheumatism	10	—	—	—	—	1	·59
Debility	9	—	—	—	—	—	·49
Other General Diseases	4	—	—	—	—	—	·23
LOCAL DISEASES.							
Diseases of the—							
Nervous System (Nervous)	3	—	—	—	—	—	·05
Nervous System (Mental)	1	—	—	—	—	—	·13
Eye	2	—	—	—	—	—	·09
Other Organs of Special Sense	2	—	—	—	—	—	·04
Circulatory System	4	—	—	—	—	2	·69
Respiratory ,,	14	—	—	—	—	—	1·07
Digestive ,,	32	1	—	1	—	1	1·16
Lymphatic ,,	10	—	—	—	—	—	·82
Urinary ,,	4	—	—	—	—	1	·60
Generative ,,	8	—	—	—	—	—	·51
Organs of Locomotion	6	—	—	—	—	1	·37
Connective Tissue	9	—	—	—	—	—	·56
Skin	9	—	—	—	—	—	·77
INJURIES.							
General	—	—	—	—	—	—	—
Local	20	—	—	—	—	—	1·06
In Action	—	—	—	—	—	—	—
POISONS	—	—	—	—	—	—	—
No appreciable disease	—	—	—	—	—	—	—
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	396	2	—	2	—	33	27·03

into Hospital, Deaths, Numbers Invalided and Constantly Sick, among with the Ratios per 1,000 of the Strength, and the Average Ratios for 10 years.

Ratio per 1,000.					Average Ratio per 1,000 from 1892 to 1899.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	5·0	—	—	—	·34
57·8	—	—	—	1·57	1·7	—	—	—	·03
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	1·3	·65	—	—	·16
45·4	—	—	—	1·53	71·9	—	—	—	1·74
—	—	—	—	—	—	—	—	—	—
2·1	—	—	—	·29	3·5	·22	—	·44	·34
—	—	—	—	—	·2	·22	—	—	—
84·7	—	—	2·07	3·88	156·0	1·75	—	·44	4·56
—	—	—	—	—	—	—	—	—	—
14·5	2·07	—	10·33	1·72	10·9	4·37	—	5·68	1·81
132·2	—	—	—	12·05	60·9	—	—	—	5·90
86·8	—	—	43·39	9·65	51·5	—	—	5·02	5 78
78·5	—	—	—	5·14	147·0	—	—	—	9·81
—	—	—	—	—	—	—	—	—	—
10·3	—	—	—	·76	21·2	—	—	—	·70
—	—	—	—	·19	—	—	—	—	—
2·1	—	—	—	—	1·3	—	—	—	·03
20·7	—	—	2·07	1·22	70·3	—	—	1·09	4·01
18·6	—	—	—	1·01	12·2	—	—	1·31	·83
8·3	—	—	—	·48	8·1	·44	—	·22	·35
6·2	—	—	—	·10	9·6	—	—	1·31	·54
2·1	—	—	—	·27	2·0	—	—	1·75	·37
4·1	—	—	—	·19	22·9	—	—	·87	1·49
4·1	—	—	—	·08	4·4	—	—	·66	·22
8·3	—	—	4·13	1·43	10·5	·87	—	2·40	·91
28·9	—	—	—	2·21	38·7	1·53	—	1·09	2·60
66·1	2·07	—	2·07	2·40	87·4	·22	—	1·31	2·83
20·7	—	—	—	1·69	39·1	·22	—	1·09	3·41
8·3	—	—	2·07	1·24	3·7	—	—	1·09	·40
16·5	—	—	—	1·05	156·2	—	—	·44	12·38
12·4	—	—	2·07	·76	8·3	—	—	1·53	·83
18·6	—	—	—	1·16	30·4	—	—	·22	1·83
18·6	—	—	—	1·59	33·9	—	—	—	1·83
—	—	—	—	—	—	—	—	—	—
41·3	—	—	—	2 19	79·1	·22	—	·87	2·74
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·4	—	—	—	·02
—	—	—	—	—	9·6	—	—	—	·18
—	—	—	—	—	—	—	—	—	—
818·2	4·13	—	68·18	55·85	1159·2	10·70	—	28·83	68·97

ABSTRACT No. IX.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the EUROPEAN TROOPS stationed at JAMAICA during the Year 1900, with the

Average Strength, 566. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent Home.	Invalids. Number finally Discharged the Service.	Average Number constantly Sick.
GENERAL DISEASES.							
Small-pox	—	—	—	—	—	—	—
Other Eruptive Fevers	1	—	—	—	—	—	·05
Influenza	9	—	—	—	—	—	·30
Diphtheria	—	—	—	—	—	—	—
Enteric Fever	5	1	—	1	—	—	·71
Other Continued Fevers	1	—	—	—	—	—	·02
Cholera	—	—	—	—	—	—	—
Dysentery	6	—	—	—	—	—	·20
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	33	—	—	—	—	—	1·93
Septic Diseases	—	—	—	—	—	—	—
Tubercular Diseases	3	—	1	1	3	2	·51
Syphilis, Primary	38	—	—	—	—	—	2·93
,, Secondary	21	—	—	—	4	—	2·82
Gonorrhœa	53	—	—	—	—	—	4·34
Hydrophobia	—	—	—	—	—	—	—
Parasitic Diseases	—	—	—	—	—	—	—
Scurvy	—	—	—	—	—	—	—
Alcoholism	3	—	—	—	—	—	·03
Rheumatism	16	—	—	—	—	—	·71
Debility	1	—	—	—	—	—	·09
Other General Diseases	—	—	—	—	—	—	—
LOCAL DISEASES.							
Diseases of the—							
Nervous System { Nervous	2	—	—	—	—	—	·09
Nervous System { Mental	—	—	—	—	1	1	·10
Eye	7	—	—	—	1	—	·61
Other Organs of Special Sense	2	—	—	—	1	1	·13
Circulatory System	2	—	—	—	2	2	·40
Respiratory ,,	14	—	—	—	—	—	·43
Digestive ,,	23	—	—	—	—	—	·93
Lymphatic ,,	15	—	—	—	—	—	2·41
Urinary ,,	1	—	—	—	—	—	·24
Generative ,,	18	—	—	—	—	—	1·60
Organs of Locomotion	5	—	—	—	—	—	·17
Connective Tissue	12	—	—	—	1	—	·77
Skin	8	—	—	—	—	—	·77
INJURIES.							
General	—	—	—	—	—	—	—
Local	42	2	—	2	—	—	1·66
In Action	—	—	—	—	—	—	—
POISONS.	—	—	—	—	—	—	—
No appreciable disease	1	—	—	—	—	—	·01
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	312	3	1	4	13	6	25·01

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.					Average Ratio per 1,000 from 1890 to 1899.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
1·8	—	—	—	·09	·5	—	—	—	·02
15·9	—	—	—	·53	25·2	—	—	—	·58
—	—	—	—	—	—	—	—	—	—
8·8	1·77	—	—	1·25	9·2	3·05	—	—	1·33
1·8	—	—	—	·04	64·9	—	—	—	2·44
—	—	—	—	—	—	—	—	—	—
10·6	—	—	—	·35	11·9	·18	·18	—	·69
—	—	—	—	—	4·7	2·70	—	—	·27
58·3	—	—	—	3·50	57·4	1·08	·90	—	2·96
—	—	—	—	—	—	—	—	—	—
5·3	1·77	5·30	3·53	·90	3·2	·54	2·70	1·80	·77
67·1	—	—	—	5·27	72·5	—	—	—	6·46
37·1	—	7·07	—	4·08	42·3	·18	1·98	1·08	4·03
93·7	—	—	—	7·67	92·4	—	·36	—	6·57
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	5·9	—	—	—	·19
—	—	—	—	—	—	—	—	—	—
5·3	—	—	—	·14	5·2	·18	—	—	·16
28·3	—	—	—	1·25	20·3	·18	1·26	·36	1·40
1·8	—	—	—	·16	10·4	—	2·70	1·26	·67
—	—	—	—	—	4·1	—	·18	·36	·37
3·5	—	—	—	·16	6·7	·36	1·98	1·98	·62
—	—	1·77	1·77	·18	·7	—	·54	·54	·10
12·4	—	1·77	—	1·08	7·6	—	·36	·36	·45
3·5	—	1·77	1·77	·23	12·8	—	·72	·54	·60
3·5	—	3·53	3·53	·71	9·0	·72	3·23	2·16	·96
24·7	—	—	—	·76	22·6	·36	—	·36	1·20
40·6	—	—	—	1·64	68·7	·36	2·70	1·62	2·64
26·5	—	—	—	4·08	30·6	—	·18	—	4·11
1·8	—	—	—	·42	·7	—	—	·18	·05
31·8	—	—	—	2·83	28·8	—	—	—	1·71
8·8	—	—	—	·30	10·1	—	1·98	1·08	1·01
21·2	—	1·77	—	1·36	26·6	—	—	—	1·01
14·1	—	—	—	1·36	30·9	—	·18	·18	1·29
—	—	—	—	—	1·1	·54	—	—	·02
74·2	3·53	—	—	2·93	112·6	1·62	2·88	1·44	4·93
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·7	·18	—	—	·03
1·8	—	—	—	·02	2·2	—	—	—	·09
—	—	—	—	—	—	·18	—	—	—
604·2	7·07	22·97	10·60	44·19	802·7	12·41	25·00	15·29	49·73

ABSTRACT No. X.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the NON-EUROPEAN TROOPS stationed at JAMAICA during the Year 1900, with

Average Strength, 1,092. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent Home.	Invalids. Number finally discharged the service.	Average Number constantly sick.
GENERAL DISEASES.							
Small-pox	—	—	—	—	—	—	—
Other Eruptive Fevers	26	—	—	—	—	—	1·42
Influenza	63	—	—	—	—	—	2·35
Diphtheria	—	—	—	—	—	—	—
Enteric Fever	6	1	—	1	—	—	1·20
Other Continued Fevers	9	—	—	—	—	—	·30
Cholera	—	—	—	—	—	—	—
Dysentery	13	—	—	—	—	—	·78
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	404	3	—	3	—	11	18·37
Septic Diseases	—	—	—	—	—	—	—
Tubercular Diseases	7	—	—	—	—	5	·77
Syphilis, Primary	189	—	—	—	—	—	18·04
,, Secondary	31	—	—	—	—	14	5·06
Gonorrhœa	213	—	—	—	—	—	19·28
Hydrophobia	—	—	—	—	—	—	—
Parasitic Diseases	55	—	—	—	—	—	1·56
Scurvy	—	—	—	—	—	—	—
Alcoholism	1	1	—	1	—	—	·00
Rheumatism	24	—	—	—	—	9	·56
Debility	14	—	—	—	—	6	1·42
Other General Diseases	6	—	—	—	—	1	·16
LOCAL DISEASES.							
Diseases of the—							
Nervous System (Nervous)	2	—	—	—	—	—	·15
Nervous System (Mental)	1	—	—	—	—	2	·19
Eye	24	—	—	—	—	4	2·18
Other Organs of Special Sense	7	—	—	—	—	—	·27
Circulatory System	17	—	—	—	—	7	1·69
Respiratory ,,	59	1	—	1	—	1	4·59
Digestive ,,	90	—	—	—	—	6	2·81
Lymphatic ,,	24	—	—	—	—	—	3·02
Urinary ,,	—	—	—	—	—	—	—
Generative ,,	9	—	—	—	—	2	1·00
Organs of Locomotion	7	—	—	—	—	1	·51
Connective Tissue	32	—	—	—	—	—	1·01
Skin	54	—	—	—	—	4	2·75
INJURIES.							
General	—	1	—	1	—	—	—
Local	79	—	—	—	—	2	3·05
In Action	—	—	—	—	—	—	—
POISONS	—	—	—	—	—	—	—
No appreciable disease	1	—	—	—	—	—	·03
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	1467	7	—	7	—	75	94·52

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK, among the Ratios per 1,000 of the Strength, and the Average Ratios for 10 years.

Ratio per 1,000.					Average Ratio per 1,000 from 1890 to 1899.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
23·8	—	—	—	1·30	12·5	—	—	—	·45
57·7	—	—	—	2·15	10·6	—	—	—	·39
—	—	—	—	—	—	—	—	—	—
5·5	·92	—	—	1·10	4·2	2·35	—	—	·39
8·2	—	—	—	·27	89·9	·32	—	—	2·91
—	—	—	—	—	—	—	—	—	—
11·9	—	—	—	·71	28·6	·64	—	—	1·59
—	—	—	—	—	·6	·21	—	—	·04
370·0	2·75	—	10·08	16·82	153·5	2·56	—	1·28	7·66
—	—	—	—	—	·1	—	—	—	·01
6·4	—	—	4·58	·71	14·8	2·77	—	9·60	2·04
173·1	—	—	—	16·52	138·7	—	—	—	12·84
28·4	—	—	12·82	4·63	41·7	·11	—	7·04	4·67
196·1	—	—	—	17·66	157·1	—	—	—	11·46
—	—	—	—	—	—	—	—	—	—
50·4	—	—	—	1·43	39·4	—	—	—	1·27
—	—	—	—	—	—	—	—	—	—
·9	·92	—	—	·00	·2	—	—	—	·01
22·0	—	—	8·24	·51	41·5	—	—	3·84	2·90
12·8	—	—	5·49	1·30	8·5	—	—	2·88	·78
5·5	—	—	·92	·15	17·8	·11	—	·75	·82
1·8	—	—	—	·14	9·1	—	—	2·67	·78
·9	—	—	1·83	·17	·9	—	—	·85	·23
22·0	—	—	3·66	2·00	25·2	—	—	2·14	1·76
6·4	—	—	—	·25	9·4	—	—	·82	·42
15·6	—	—	6·41	1·55	21·7	·53	—	6·51	2·17
54·0	·92	—	·92	4·20	52·8	1·92	—	1·60	3·57
82·4	—	—	5·49	2·57	71·6	·32	—	1·71	2·41
22·0	—	—	—	2·77	36·4	—	—	1·07	3·52
—	—	—	—	—	2·1	·43	—	·32	·16
8·2	—	—	1·83	·92	40·9	—	—	1·60	3·05
6·4	—	—	·92	·47	7·2	·11	—	1·28	·64
29·3	—	—	—	·92	30·9	—	—	—	1·95
49·5	—	—	3·66	2·52	43·2	—	—	·64	2·72
—	·92	—	—	—	·4	·85	—	—	·01
72·3	—	—	1·83	2·79	76·5	·11	—	1·60	3·85
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·2	—	—	—	—
·9	—	—	—	·03	3·7	—	—	—	·09
—	—	—	—	—	—	—	—	—	—
1343·4	6·41	—	68·68	86·56	1191·9	13·34	—	47·70	77·55

ABSTRACT No. XI.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the EUROPEAN TROOPS stationed at WESTERN AFRICA during the Year 1900,

Average Strength, 78. — Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent Home.	Invalids. Number finally Discharged the Service.	Average Number constantly Sick.
GENERAL DISEASES.							
Small-pox	—	—	—	—	—	—	—
Other Eruptive Fevers	—	—	—	—	—	—	—
Influenza	—	—	—	—	—	—	—
Diphtheria	—	—	—	—	—	—	—
Enteric Fever	—	—	—	—	—	—	—
Other Continued Fevers	—	—	—	—	—	—	—
Cholera	—	—	—	—	—	—	—
Dysentery	—	—	—	—	—	—	—
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	111	—	—	—	11	—	3·96
Septic Diseases	—	—	—	—	—	—	—
Tubercular Diseases	—	—	—	—	—	—	—
Syphilis, Primary	4	—	—	—	—	—	·46
,, Secondary	1	—	—	—	—	—	·03
Gonorrhœa	7	—	—	—	—	—	·54
Hydrophobia	—	—	—	—	—	—	—
Parasitic Diseases	—	—	—	—	—	—	—
Scurvy	—	—	—	—	—	—	—
Alcoholism	4	—	—	—	—	—	·10
Rheumatism	3	—	—	—	1	—	·44
Debility	8	—	—	—	4	—	·21
Other General Diseases	—	—	—	—	—	—	—
LOCAL DISEASES.							
Diseases of the—							
Nervous System { Nervous	—	—	—	—	—	—	—
Nervous System { Mental	1	—	—	—	1	—	·10
Eye	—	—	—	—	—	—	—
Other Organs of Special Sense	—	—	—	—	—	—	—
Circulatory System	—	—	—	—	—	—	—
Respiratory ,,	—	—	—	—	—	—	—
Digestive ,,	9	—	—	—	—	—	·32
Lymphatic ,,	5	—	—	—	1	—	·40
Urinary ,,	1	—	—	—	—	—	·02
Generative ,,	1	—	—	—	—	—	·06
Organs of Locomotion	—	—	—	—	—	—	—
Connective Tissue	—	—	—	—	—	—	—
Skin	3	—	—	—	—	—	·12
INJURIES.							
General	—	—	—	—	—	—	—
Local	3	—	—	—	1	—	·16
In Action	—	—	—	—	—	—	—
POISONS	—	—	—	—	—	—	—
No appreciable disease	—	—	—	—	—	—	—
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	161	—	—	—	19	—	6·92
Average of 10 years, 1890–99	—	—	—	—	—	—	—

* The average ratios for 10 years will be given in

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK, among with the Ratios per 1,000 of the Strength, and the Average Ratios for 10 years.*

Ratio per 1,000.					*Ratio per 1,000 from 1897 to 1899.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	5·7	5·71	5·71	—	2·11
—	—	—	—	—	—	—	—	—	—
1423·1	—	141·03	—	50·77	1840·0	17·14	200·00	—	55·66
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
51·3	—	—	—	5·90	45·7	—	—	—	3·09
12·8	—	—	—	·39	34·3	—	11·43	—	2·29
89·7	—	—	—	6·92	74·3	—	5·71	—	4·80
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	11·4	—	—	—	·34
—	—	—	—	—	—	—	—	—	—
51·3	—	—	—	1·28	17·1	—	5·71	—	1·37
38·5	—	12·82	—	5·64	28·6	—	—	—	1·71
102·6	—	51·28	—	2·69	22·9	—	—	—	·69
—	—	—	—	—	22·9	5·71	—	5·71	·57
—	—	—	—	—	22·9	—	—	—	·34
12·8	—	12·82	—	1·28	—	—	—	5·71	—
—	—	—	—	—	22·9	—	—	—	·80
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	11·3	5·71	—	—	·17
—	—	—	—	—	17·1	—	—	—	·57
115·3	—	—	—	4·10	142·9	5·71	17·14	5·71	9·60
64·1	—	12·82	—	5·13	45·7	—	—	—	4·29
12·8	—	—	—	·26	—	—	—	—	—
12·8	—	—	—	·77	91·4	—	17·14	—	6·06
—	—	—	—	—	22·9	—	11·43	—	·86
—	—	—	—	—	11·4	—	—	—	·23
38·5	—	—	—	1·54	11·4	—	—	—	1·09
—	—	—	—	—	—	—	—	—	—
38·5	—	12·82	—	2·05	62·9	—	—	—	1·48
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	5·7	—	—	—	·11
—	—	—	—	—	5·7	—	—	—	·11
—	—	—	—	—	—	—	—	—	—
2064·1	—	243·59	—	88·72	2577·1	40·00	274·28	17·14	98·34
2072·6	44·25	258·85	13·27	93·41	—	—	—	—	—

future years. See footnote to report for 1898.

ABSTRACT No. XII.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the NON-EUROPEAN TROOPS stationed at WESTERN AFRICA during the Year 1900,

Average Strength, 1,506. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent to West Indies.	Invalids. Number finally Discharged the Service.	Average Number constantly Sick.
GENERAL DISEASES.							
Small-pox	—	—	—	—	—	—	—
Other Eruptive Fevers	16	—	—	—	—	—	·89
Influenza	—	—	—	—	—	—	—
Diphtheria	—	—	—	—	—	—	—
Enteric Fever	1	1	—	1	—	—	·04
Other Continued Fevers	2	—	—	—	—	—	·17
Cholera	—	—	—	—	—	—	—
Dysentery	17	—	—	—	—	—	·67
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	1,188	5	—	5	17	2	27·46
Septic Diseases	1	1	—	1	—	—	·04
Tubercular Diseases	5	2	—	2	3	3	·79
Syphilis, Primary	113	—	—	—	—	—	8·75
,, Secondary	83	—	—	—	7	2	5·83
Gonorrhœa	246	—	—	—	—	—	12·18
Hydrophobia	—	—	—	—	—	—	—
Parasitic Diseases	75	—	—	—	—	—	1·73
Scurvy	—	—	—	—	—	—	—
Alcoholism	—	—	—	—	—	—	—
Rheumatism	74	—	—	—	1	—	3·42
Debility	17	—	—	—	9	3	1·10
Other General Diseases	4	1	—	1	—	—	·11
LOCAL DISEASES.							
Diseases of the—							
Nervous System { Nervous	8	—	—	—	2	2	·57
Nervous System { Mental	1	—	—	—	—	—	·06
Eye	40	—	—	—	—	—	1·28
Other Organs of Special Sense	2	—	—	—	—	—	·02
Circulatory System	18	—	—	—	1	—	1·10
Respiratory ,,	152	1	—	1	5	5	6·07
Digestive ,,	114	1	—	1	—	6	3·43
Lymphatic ,,	56	—	—	—	—	1	5·60
Urinary ,,	2	—	—	—	—	—	·15
Generative ,,	111	—	—	—	2	—	7·64
Organs of Locomotion	39	—	—	—	—	1	1·14
Connective Tissue	85	—	—	—	—	—	2·92
Skin	287	—	—	—	—	—	10·91
INJURIES.							
General	—	—	—	—	—	—	—
Local	145	—	—	—	—	2	6·83
In Action	—	—	—	—	—	—	—
POISONS	2	—	—	—	—	—	·04
No appreciable disease	—	—	—	—	—	—	—
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	2,944	12	—	12	47	27	111·72

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK, among with the Ratios per 1,000 of the Strength, and the Average Ratios for 10 years.

Ratio per 1,000.					Average Ratio per 1,000 from 1890 to 1899.				
Admissions.	Deaths.	Invalids sent to West Indies.	Invalids finally discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent to West Indies.	Invalids finally discharged.	Constantly Sick.
—	—	—	—	—	·8	·10	—	—	·08
10·6	—	—	—	·59	5·8	—	—	—	·23
—	—	—	—	—	5·0	·10	—	—	·21
—	—	—	—	—	—	—	—	—	—
·7	·66	—	—	·03	·2	·20	—	—	·04
1·3	—	—	—	·11	·7	—	—	·10	·09
—	—	—	—	—	—	—	—	—	—
11·3	—	—	—	·44	8·1	·80	·50	—	·43
—	—	—	—	—	—	—	—	—	—
788·9	3·32	11·29	1·33	15·23	933·4	6·01	7·51	1·40	28·42
·7	·66	—	—	·03	·4	—	—	—	·01
3·3	1·33	1·99	1·99	·53	12·7	4·90	6·91	4·11	2·23
75·0	—	—	—	5·81	43·2	—	·10	—	3·83
55·1	—	4·65	1·33	3·89	50·6	—	7·71	4·01	5·20
163·4	—	—	—	8·09	111·9	—	·20	—	6·70
—	—	—	—	—	—	—	—	—	—
49·8	—	—	—	1·15	38·2	—	—	—	1·24
—	—	—	—	—	·3	—	—	—	·02
—	—	—	—	—	·6	—	—	—	·02
49·1	—	·66	—	2·27	69·6	·10	4·30	1·60	4·68
11·3	—	5·98	1·99	·73	12·4	—	4·70	·50	·93
2·7	·66	—	—	·07	8·6	·20	·10	·20	·27
5·3	—	1·33	1·33	·38	8·0	·40	1·40	·90	·67
·7	—	—	—	·04	1·5	—	·60	·60	·14
26·6	—	—	—	·85	18·5	—	·60	·50	1·18
1·3	—	—	—	·01	5·3	—	·60	·50	·42
11·9	—	·66	—	·73	16·2	1·00	5·40	3·20	1·20
100·9	·66	3·32	3·32	4·03	55·8	2·30	1·90	·80	2·88
75·7	·66	—	3·98	2·32	58·9	·60	1·60	1·10	2·16
63·7	—	—	·66	3·65	33·8	·10	·90	·40	2·93
1·3	—	—	—	·10	3·3	·80	1·10	·80	·32
73·7	—	1·33	—	5·07	77·6	—	1·80	2·00	5·42
25·9	—	—	·66	·76	11·8	·10	1·70	1·30	·36
56·4	—	—	—	2·60	38·8	·20	·20	—	1·94
190·6	—	—	—	7·24	92·0	—	·70	·40	5·10
—	—	—	—	—	·1	·30	—	—	—
96·3	—	—	1·33	4·40	63·5	·20	·50	1·50	3·67
—	—	—	—	—	1·3	·10	2·30	1·30	·16
1·3	—	—	—	·03	·1	—	—	—	—
—	—	—	—	—	·7	—	—	—	·02
—	—	—	—	—	—	—	—	—	—
1,864·8	7·97	31·21	17·93	74·18	1,789·7	18·51	53·33	27·22	83·80

ABSTRACT No. XIV.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the Troops stationed at MAURITIUS during the Year 1900, with the

Average Strength, 463. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent Home.	Invalids. Number finally Discharged the Service.	Average Number constantly Sick.
GENERAL DISEASES.							
Small-pox	—	—	—	—	—	—	—
Other Eruptive Fevers	1	—	—	—	—	—	·20
Plague	—	—	—	—	—	—	—
Influenza	—	—	—	—	—	—	—
Diphtheria	—	—	—	—	—	—	—
Enteric Fever	12	2	—	2	—	—	2·04
Other Continued Fevers	1	—	—	—	—	—	·06
Cholera	—	—	—	—	—	—	—
Dysentery	7	—	—	—	—	—	·45
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	96	1	—	1	—	—	6·61
Septic Diseases	—	—	—	—	—	—	—
Tubercular Diseases	—	—	—	—	—	—	—
Syphilis, Primary	36	—	—	—	—	—	3·39
,, Secondary	11	—	—	—	4	—	2·42
Gonorrhœa	40	—	—	—	—	—	2·61
Hydrophobia	—	—	—	—	—	—	—
Parasitic Diseases	2	—	—	—	—	—	·07
Scurvy	—	—	—	—	—	—	—
Alcoholism	1	—	—	—	—	—	·04
Rheumatism	3	—	—	—	1	—	·43
Debility	8	—	—	—	1	—	·78
Other General Diseases	2	—	—	—	—	—	·16
LOCAL DISEASES.							
Diseases of the—							
Nervous System { Nervous	4	—	—	—	—	—	·38
Nervous System { Mental	1	—	—	—	1	1	·10
Eye	1	—	—	—	—	—	·02
Other Organs of Special Sense	5	—	—	—	—	—	·27
Circulatory System	1	—	—	—	1	1	·35
Respiratory ,,	5	—	—	—	1	—	·23
Digestive ,,	19	—	—	—	—	—	·63
Lymphatic ,,	11	—	—	—	—	—	1·14
Urinary ,,	—	—	—	—	—	1	—
Generative ,,	6	—	—	—	—	—	·18
Organs of Locomotion	—	—	—	—	—	—	·04
Connective Tissue	7	—	—	—	—	—	·39
Skin	11	—	—	—	—	—	·43
INJURIES.							
General	1	—	—	—	—	—	·02
Local	54	—	—	—	—	—	2·02
In Action	—	—	—	—	—	—	—
POISONS	—	—	—	—	—	—	—
No appreciable disease	3	—	—	—	—	—	·06
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	349	3	—	3	9	3	26·06

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.					Average Ratio per 1,000 from 1890 to 1899.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	·2	—	—	—	·02
2·2	—	—	—	·43	18·4	—	—	—	1·22
—	—	—	—	—	·2	·15	—	—	—
—	—	—	—	—	4·6	—	—	—	·15
—	—	—	—	—	—	—	—	—	—
25·9	4·32	—	—	4·41	16·4	5·51	·31	—	2·37
2·2	—	—	—	·13	·2	—	—	—	·04
—	—	—	—	—	—	—	—	—	—
15·1	—	—	—	·97	10·1	·31	·92	—	·97
—	—	—	—	—	—	—	—	—	—
207·4	2·16	—	—	13·87	510·4	2·30	26·78	1·07	22·72
—	—	—	—	—	·2	—	—	—	·01
—	—	—	—	—	1·8	·76	1·23	·92	·28
77·3	—	—	—	8·40	44·7	—	·15	·15	4·24
23·8	—	8·64		5·23	33·8	—	2·14	·92	3·33
86·4	—	—	—	5·64	107·9	—	·15	—	7·83
—	—	—	—	—	—	—	—	—	—
4·3	—	—	—	·15	20·7	—	—	—	·50
—	—	—	—	—	—	—	—		—
2·2	—	—	—	·09	2·6	·15	—		·09
6·5	—	2·16	—	·93	17·3	—	1·23	·61	1·11
17·3	—	2·16	—	1·68	10·2	·15	2·45	·76	·62
4·3	—	—	—	·34	9·6	—	·15	·31	64
8·6	—	—	—	·82	8·4	·46	1·23	1·53	·48
2·2	—	2·16	2·16	·22	1·8	·15	1·53	1·84	·31
2·2	—	—	—	·04	10·2	—	1·07	·31	·78
10·8	—	—	—	·58	17·6	—	1·68	·76	1·02
2·2	—	2·16	2·16	·76	9·9	·92	2·14	2·45	·68
10·8	—	2·16	—	·50	27·2	—	·46	—	1·46
41·1	—	—	—	1·36	113·1	·92	1·53	·31	4·14
23·8	—	—	—	2·46	33·4	—	·61	—	4·62
—	—	—	2·16	—	3·7	·31	·92	·31	·22
13·0	—	—	—	·39	49·4	—	·31	·15	3·69
—	—	—	—	·09	8·1	—	—	·15	·53
15·1	—	—	—	·84	23·3	—	—	—	·90
23·8	—	—	—	1·36	45·1	—	·15	—	2·18
2·2	—	—	—	·04	·9	·92	·15	—	·02
116·6	—	—	—	4·36	119·4	·46	·77	·31	4·96
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·2	—	—	—	—
6·5	—	—	—	·17	4·1	—	—	—	·15
—	—	—	—	—	—	—	—	—	—
753·8	8·48	19·44	6·48	56·26	1255·1	13·47	48·06	12·86	72·38

ABSTRACT No. XV.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the Troops stationed at CEYLON during the Year 1900, with the Ratios

Average Strength, 1,030. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent Home.	Invalids. Number finally Discharged the Service.	Average Number constantly Sick.
GENERAL DISEASES.							
Small-pox	—	—	—	—	—	—	—
Other Eruptive Fevers	—	—	—	—	—	—	—
Influenza	1	—	—	—	—	—	·02
Diphtheria	—	—	—	—	—	—	—
Enteric Fever	31	5	—	5	1	—	3·49
Other Continued Fevers	59	—	—	—	—	—	1·92
Cholera	—	—	—	—	—	—	—
Dysentery	9	—	—	—	1	—	·50
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	62	1	—	1	—	—	1·93
Septic Diseases	—	—	—	—	—	—	·07
Tubercular Diseases	4	1	—	1	4	2	·36
Syphilis, Primary	30	—	—	—	—	—	1·91
,, Secondary	13	—	—	—	2	—	1·08
Gonorrhœa	88	—	—	—	—	—	5·33
Hydrophobia	—	—	—	—	—	—	—
Parasitic Diseases	15	—	—	—	—	—	·26
Scurvy	—	—	—	—	—	—	—
Alcoholism	6	—	—	—	—	—	·34
Rheumatism	22	—	—	—	1	—	·97
Debility	27	—	—	—	4	2	1·19
Other General Diseases	5	—	—	—	2	—	·28
LOCAL DISEASES.							
Diseases of the—							
Nervous System (Nervous)	7	—	—	—	—	—	·21
Nervous System (Mental)	2	1	—	1	—	—	·22
Eye	17	—	—	—	—	—	·86
Other Organs of Special Sense	25	—	—	—	1	—	·68
Circulatory System	9	—	—	—	2	—	·70
Respiratory ,,	18	1	—	1	—	—	1·42
Digestive ,,	84	1	—	1	1	1	2·19
Lymphatic ,,	31	—	—	—	—	—	3·68
Urinary ,,	5	—	—	—	—	—	·26
Generative ,,	50	—	—	—	1	—	3·06
Organs of Locomotion	9	—	—	—	—	—	·28
Connective Tissue	39	—	—	—	—	—	·94
Skin	87	—	—	—	—	—	2·56
INJURIES.							
General	—	1	—	1	—	—	—
Local	84	—	—	—	—	—	2·06
In Action	—	—	—	—	—	—	—
POISONS	2	—	—	—	—	—	·04
No appreciable disease	3	—	—	—	—	—	·05
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	844	11	—	11	20	5	39·46

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK, among per 1,000 of the Strength, and the Average Ratios for 10 years.

Ratio per 1,000.					Average Ratio per 1,000 from 1890 to 1899.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	·01
—	—	—	—	—	1·3	—	—	—	·04
1·0	—	—	—	·02	4·1	—	—	—	·09
—	—	—	—	—	—	—	—	—	—
30·1	4·85	·97	—	3·39	4·5	1·06	·08	—	·61
57·3	—	—	—	1·86	39·3	·15	·06	—	1·35
—	—	—	—	—	·1	·06	—	—	—
8·7	—	·97	—	·49	17 5	·68	·76	·15	1·20
—	—	—	—	—	—	—	—	—	—
60·2	·97	—	—	1·87	131·7	·91	·68	—	3·73
—	—	—	—	·07	·2	·06	—	—	·01
3·9	·97	3·88	1·94	·35	3·6	·61	2·43	1·67	·44
29·1	—	—	—	1·85	87·2	—	—	—	7·44
12·6	—	1·94	—	1·05	55·2	·06	2·80	1·74	4·60
85·4	—	—	—	5·18	122·7	—	·45	·15	8·06
—	—	—	—	—	—	—	—	—	—
14·6	—	—	—	·25	14·7	—	—	—	·39
—	—	—	—	—	·1	—	—	—	—
5·8	—	—	—	·33	5·1	·06	—	—	·16
21·4	—	·97	—	·94	17·9	·06	·83	·23	1·65
26·2	—	3·88	1·94	1·16	27·9	—	2·59	·99	1·06
4·9	—	1·94	—	·27	7·4	·06	·30	·30	·38
6·8	—	—	—	·20	6·0	·45	·76	·46	·26
1·9	·97	—	—	·21	1·1	—	1·06	1·06	·35
16·5	—	—	—	·84	13·5	—	·53	·38	·65
24·3	—	·97	—	·66	15·2	—	·38	·30	·52
8·7	—	1·94	—	·68	8·2	·98	1·59	1·36	·67
17·4	·97	—	—	1·38	23·2	·38	·45	·30	1 03
81·6	·97	·97	·97	2·13	90·5	1·14	1·89	·23	3·17
30·1	—	—	—	3·57	50·2	—	·23	—	5·97
4·9	—	—	—	·25	1·1	·06	·15	·08	·07
48·5	—	·97	—	2·97	45·9	—	·30	·08	3·29
8·7	—	—	—	·27	8·6	—	·61	·53	·52
37·9	—	—	—	·91	32·7	—	—	—	1·40
84·5	—	—	—	2·49	50·6	—	·08	—	3·17
—	·97	—	—	—	1·3	1·36	·15	—	·10
81·6	—	—	—	2·58	83·8	·61	·38	·30	3·41
—	—	—	—	—	—	—	—	—	—
1·9	—	—	—	·04	—	—	—	—	—
2·9	—	—	—	·05	4·8	—	—	—	·12
—	—	—	—	—	—	—	—	—	—
819·4	10·68	19·42	4·85	33·31	1,007·2	8·87	19·55	10·31	55·94

ABSTRACT No. XVI.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS among the TROOPS stationed in CHINA during the Year 1900, with the

Average Strength, 1,484. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent Home.	Invalids. Number finally Discharged the Service.	Average Number constantly Sick.
GENERAL DISEASES.							
Small-pox	—	—	—	—	—	—	—
Other Eruptive Fevers	—	—	—	—	—	—	—
Plague	1	—	—	—	—	—	·09
Influenza	2	—	—	—	—	—	·16
Diphtheria	—	—	—	—	—	—	—
Enteric Fever	5	1	—	1	1	—	1·50
Other Continued Fevers	—	—	—	—	—	—	·01
Cholera	—	—	—	—	—	—	—
Dysentery	16	2	—	2	—	—	2·09
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	629	4	—	4	16	—	28·33
Septic Diseases	—	—	—	—	—	—	—
Tubercular Diseases	4	—	—	—	3	4	1·12
Syphilis, Primary	38	—	—	—	—	—	3·93
,, Secondary	116	2	1	3	11	1	12·84
Gonorrhœa	169	—	—	—	2	—	16·79
Hydrophobia	—	—	—	—	—	—	—
Parasitic Diseases	22	—	—	—	—	—	·87
Scurvy	—	—	—	—	—	—	—
Alcoholism and Delirium Tremens	21	4	—	4	—	—	·72
Rheumatism	35	—	—	—	2	—	2·79
Debility	23	—	—	—	8	—	1·72
Other General Diseases	16	—	—	—	1	—	1·04
LOCAL DISEASES.							
Diseases of the—							
Nervous System { Nervous	28	—	—	—	2	—	1·51
Nervous System { Mental	4	—	—	—	3	2	·93
Eye	17	—	—	—	—	—	·93
Other Organs of Special Sense	41	—	—	—	2	1	2·38
Circulatory System	28	1	—	1	7	3	2·42
Respiratory ,,	66	—	1	1	1	1	3·10
Digestive ,,	203	1	1	2	1	—	7·41
Lymphatic ,,	33	—	—	—	3	—	4·05
Urinary ,,	6	2	—	2	1	—	·57
Generative ,,	128	—	—	—	1	—	9·82
Organs of Locomotion	16	—	—	—	—	—	1·00
Connective Tissue	41	—	—	—	—	—	2·08
Skin	93	—	—	—	—	—	4·23
INJURIES.							
General	5	4	—	4	—	—	·20
Local	170	2	—	2	4	1	9·02
In Action	—	—	—	—	—	—	—
POISONS	—	—	—	—	—	—	—
No appreciable disease	10	—	—	—	—	—	·33
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	1986	23	3	26	69	13	123·28

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK, Ratios per 1,000 of the Strength, and the Average Ratios for 10 years.

Ratio per 1,000.					Average Ratio per 1,000 from 1890 to 1899.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	·5	—	—	—	·03
—	—	—	—	—	·1	—	—	—	·01
·7	—	—	—	·06	1·5	·34	—	—	·14
1·3	—	—	—	·11	2·8	—	—	—	·10
—	—	—	—	—	·1	—	—	—	·01
3·4	·67	·67	—	1·01	1·7	·55	·14	—	·25
—	—	—	—	·01	16·4	—	·14	—	·66
—	—	—	—	—	·4	·34	—	—	—
10·8	1·35	—	—	1·41	7·3	·21	·55	—	·40
—	—	—	—	—	—	—	—	—	—
423·8	2·70	10·79	—	19·09	507·6	2·68	10·87	1·38	16·31
—	—	—	—	—	·5	—	—	—	·02
2·7	—	2·02	2·70	·75	3·9	·96	2·41	1·10	·71
25·6	—	—	—	2·65	61·2	—	—	—	5·84
78·2	2·02	7·41	·67	8·65	65·4	·14	3·99	1·03	5·65
113·9	—	1·35	—	11·31	195·4	—	·55	—	15·15
—	—	—	—	—	—	—	—	—	—
14·8	—	—	—	·59	15·5	—	—	—	·45
—	—	—	—	—	—	—	—	—	—
14·1	2·70	—	—	·49	3·2	·14	·21	·07	·14
23·6	—	1·35	—	1·88	23·7	·07	1·17	·41	1·30
15·5	—	5·39	—	1·16	20·2	·07	5·16	1·72	1·03
10·8	—	·67	—	·70	11·6	·21	1·03	·07	·75
18·9	—	1·35	—	1·02	7·8	·55	·82	·55	·43
2·7	—	2·02	1·35	·63	1·4	·14	1·03	·82	·27
11·5	—	—	—	·63	9·5	—	·82	·48	·38
27·6	—	1·35	·67	1·60	23·4	—	2·96	1·17	1·22
18·9	·67	4·72	2·02	1·63	14·9	1·10	4·13	3·03	1·28
44·5	·67	·67	·67	2·09	28·8	·34	1·03	·62	1·43
136·8	1·35	·67	—	4·99	100·9	·76	2·41	·62	3·90
22·2	—	2·02	—	2·73	37·0	—	·20	·27	4·02
4·0	1·35	·67	—	·38	2·7	·21	·48	·14	·27
86·2	—	·67	—	6·62	159·3	·07	·21	·21	12·82
10·8	—	—	—	·67	11·1	—	·82	·62	·67
27·6	—	—	—	1·40	29·4	—	·07	—	1·12
62·7	—	—	—	2·85	65·8	—	·14	—	2·65
3·4	2·70	—	—	·13	1·6	1·51	—	—	·07
114·6	1·35	2·70	·67	6·08	99·4	1·17	·62	·62	4·03
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·1	—	—	—	
6·7	—	—	—	·22	1·9	—	—	—	·06
—	—	—	—	—	—	—	—	—	—
1338·3	17·52	46·49	8·76	83·54	1534·0	11·56	41·96	14·93	83·77

ABSTRACT No. XVII.—TABLE showing the AVERAGE STRENGTH, ADMIS- among the TROOPS stationed in the STRAITS SETTLEMENTS during the for 10 years.

Average Strength, 527. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent Home.	Invalids. Number finally Discharged the Service.	Average number constantly Sick.
GENERAL DISEASES.							
Small-pox	—	—	—	—	—	—	—
Other Eruptive Fevers	—	—	—	—	—	—	—
Influenza	3	—	—	—	—	—	·08
Diphtheria	—	—	—	—	—	—	—
Enteric Fever	—	—	—	—	3	—	·36
Other Continued Fevers	22	—	—	—	—	—	1·40
Cholera	1	1	—	1	—	—	—
Dysentery	4	—	—	—	—	—	·26
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	71	—	—	—	3	—	2·98
Septic Diseases	—	—	—	—	—	—	—
Tubercular Diseases	2	—	—	—	2	3	·28
Syphilis, Primary	7	—	—	—	—	—	·75
„ Secondary	27	1	—	1	5	2	3·19
Gonorrhœa	40	1	—	1	1	—	3·11
Hydrophobia	—	—	—	—	—	—	—
Parasitic Diseases	—	—	—	—	—	—	—
Scurvy	—	—	—	—	—	—	—
Alcoholism	1	—	—	—	—	—	·06
Rheumatism	8	—	—	—	1	—	·82
Debility	7	—	—	—	2	—	·63
Other General Diseases	1	—	—	—	—	—	·06
LOCAL DISEASES.							
Diseases of the—							
Nervous System { Nervous	3	—	—	—	—	—	·57
Nervous System { Mental	1	—	—	—	1	1	·24
Eye	3	—	—	—	—	—	·09
Other Organs of Special Sense	3	—	—	—	—	1	·07
Circulatory System	—	—	—	—	—	—	—
Respiratory „	8	—	—	—	1	—	·58
Digestive „	27	—	—	—	1	—	1·35
Lymphatic „	8	—	—	—	—	—	1·43
Urinary „	1	—	—	—	—	—	·02
Generative „	16	—	—	—	1	—	1·56
Organs of Locomotion	4	—	—	—	2	1	·25
Connective Tissue	8	—	—	—	—	—	·25
Skin	13	—	—	—	—	—	1·10
INJURIES.							
General	—	1	—	1	—	—	—
Local	49	—	—	—	—	—	2·73
In Action	—	—	—	—	—	—	—
POISONS	—	—	—	—	—	—	—
No appreciable disease	—	—	—	—	—	—	—
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	338	4	—	4	23	8	24·22

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK, Ratios per 1,000 of the Strength, and the Average Ratios for 10 years.

Ratio per 1,000.					Average Ratio per 1,000 from 1890 to 1899.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	·5	—	—	—	·03
—	—	—	—	—	·1	—	—	—	·01
·7	—	—	—	·06	1·5	·34	—	—	·14
1·3	—	—	—	·11	2·8	—	—	—	·10
—	—	—	—	—	·1	—	—	—	·01
3·4	·67	·67	—	1·01	1·7	·55	·14	—	·25
—	—	—	—	·01	16·4	—	·14	—	·66
—	—	—	—	—	·4	·34	—	—	—
10·8	1·35	—	—	1·41	7·3	·21	·55	—	·40
—	—	—	—	—	—	—	—	—	—
423·8	2·70	10·79	—	19·09	507·6	2·68	10·87	1·38	16·31
—	—	—	—	—	·5	—	—	—	·02
2·7	—	2·02	2·70	·75	3·9	·96	2·41	1·10	·71
25·6	—	—	—	2·65	61·2	—	—	—	5·84
78·2	2·02	7·41	·67	8·65	65·4	·14	3·99	1·03	5·65
113·9	—	1·35	—	11·31	195·4	—	·55	—	15·15
—	—	—	—	—	—	—	—	—	—
14·8	—	—	—	·59	15·5	—	—	—	·45
—	—	—	—	—	—	—	—	—	—
14·1	2·70	—	—	·49	3·2	·14	·21	·07	·14
23·6	—	1·35	—	1·88	23·7	·07	1·17	·41	1·30
15·5	—	5·39	—	1·16	20·2	·07	5·16	1·72	1·03
10·8	—	·67	—	·70	11·6	·21	1·03	·07	·75
18·9	—	1·35	—	1·02	7·8	·55	·82	·55	·43
2·7	—	2·02	1·35	·63	1·4	·14	1·03	·82	·27
11·5	—	—	—	·63	9·5	—	·82	·48	·58
27·6	—	1·35	·67	1·60	23·4	—	2·96	1·17	1·22
18·9	·67	4·72	2·02	1·63	14·9	1·10	4·13	3·03	1·28
44·5	·67	·67	·67	2·09	28·8	·24	1·03	·62	1·43
136·8	1·35	·67	—	4·99	100·9	·76	2·41	·82	3·90
22·2	—	2·02	—	2·73	37·0	—	·20	·27	4·02
4·0	1·35	·67	—	·38	2·7	·21	·48	·14	·27
86·2	—	·67	—	6·62	159·3	·07	·21	·21	12·82
10·8	—	—	—	·67	11·1	—	·82	·62	·67
27·6	—	—	—	1·40	29·4	—	·07	—	1·12
62·7	—	—	—	2·85	65·8	—	·14	—	2·65
3·4	2·70	—	—	·13	1·6	1·51	—	—	·07
114·6	1·35	2·70	·67	6·08	99·4	1·17	·62	·62	4·03
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·1	—	—	—	—
6·7	—	—	—	·22	1·9	—	—	—	·06
—	—	—	—	—	—	—	—	—	—
1296·3	17·52	46·49	8·76	63·54	1534·0	11·56	41·96	14·93	83·77

ABSTRACT No. XVIII.—TABLE showing the AVERAGE STRENGTH, ADMIS- among the TROOPS stationed in INDIA during the year 1900, with the

Average Strength, 60,553. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent home.	Invalids. Number finally discharged the service.	Average Number constantly Sick.
GENERAL DISEASES.							
Small-pox	36	3	—	3	—	—	3·53
Other Eruptive Fevers	57	—	—	—	—	—	3·73
Plague	6	1	—	1	—	—	1·14
Influenza	237	1	—	1	—	—	10·07
Diphtheria	3	—	—	—	1	—	·55
Enteric Fever	970	289	—	289	36	—	140·70
Other Continued Fevers	1,479	2	—	2	4	—	67·12
Cholera	107	88	—	88	—	—	1·79
Dysentery	1,561	52	6	58	67	2	108·00
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	19,445	50	12	62	190	14	710·67
Septic Diseases	44	3	—	3	1	1	3·12
Tubercular Diseases	225	39	17	56	102	49	41·77
Syphilis, Primary	2,597	—	—	—	1	—	262·77
" Secondary	3,786	13	2	15	344	59	399·06
Gonorrhœa	7,624	1	—	1	35	5	621·21
Hydrophobia	3	4	—	4	—	—	·05
Parasitic Diseases	541	—	—	—	1	—	21·26
Scurvy	4	—	—	—	—	—	·17
Alcoholism	222	2	—	2	1	—	8·34
Rheumatism	1,332	1	—	1	73	23	94·54
Debility	1,482	—	2	2	216	27	109·13
Other General Diseases	448	7	1	8	33	10	32·25
LOCAL DISEASES							
Diseases of the—							
Nervous System { Nervous	412	24	—	24	65	58	32·19
Nervous System { Mental	109	—	1	1	77	117	27·83
Eye	650	—	—	—	45	17	41·79
Other Organs of Special Sense	783	—	—	—	69	32	47·04
Circulatory System	738	33	2	35	241	159	74·29
Respiratory "	1,517	30	2	32	48	11	95·10
Digestive "	5,984	127	—	127	164	28	278·99
Lymphatic "	1,491	1	—	1	13	2	178·72
Urinary "	126	7	—	7	17	9	13·18
Generative "	4,863	—	—	—	15	1	400·17
Organs of Locomotion	646	—	—	—	55	16	43·67
Connective Tissue	1,198	2	—	2	7	2	63·98
Skin	2,706	1	—	1	8	—	129·04
INJURIES.							
General	201	64	—	64	5	7	9·43
Local	5,366	30	—	30	60	27	236·16
In Action	—	—	—	—	—	—	—
POISONS	103	10	—	10	32	1	4·02
No appreciable disease	132	—	—	—	—	—	6·64
Details not available	—	—	—	—	—	—	—
General Total	69,225	885	45	930	2,026	677	4342·21

SIONS into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK, year 1900, with the Ratios per 1,000 of the Strength, and the Average Ratios

Ratio per 1,000.					Average Ratio per 1,000 from 1890 to 1899.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally discharged.	Constantly Sick.
—	—	—	—	—	·2	—	—	—	·03
—	—	—	—	—	·1	—	—	—	·01
5·7	—	—	—	·15	2·1	—	—	—	·09
—	—	—	—	—	—	—	—	—	—
—	—	5·69	—	·68	1·7	·83	—	—	·24
41·7	—	—	—	2·66	58·9	—	·08	—	1·92
1·9	1·90	—	—	—	—	—	—	—	—
7·6	—	—	—	·49	5·8	·23	·45	·08	·54
—	—	—	—	—	—	—	—	—	—
134·7	—	5·69	—	5·66	209·5	·61	·68	—	5·40
—	—	—	—	—	·2	—	—	—	·02
3·8	—	3·79	5·69	·53	2·7	·91	1·67	·98	·65
13·3	—	—	—	1·42	114·1	—	—	—	10·42
51·2	1·90	9·49	3·79	6·05	114·3	·38	5·38	1·82	12·36
75·9	1·90	1·90	—	5·90	146·4	—	·61	·23	10·76
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	14·1	—	—	—	·29
—	—	—	—	—	—	—	—	—	—
1·9	—	—	—	·11	4·2	·07	—	—	·20
15·2	—	1·90	—	1·56	16·4	—	·83	·23	1·34
13·3	—	3·79	—	1·20	15·2	—	1·59	·83	1·33
1·9	—	—	—	·11	6·0	·15	·15	·08	·38
5·7	—	—	—	1·08	7·5	·76	·61	·53	·39
1·9	—	1·90	1·90	·46	1·4	—	·98	·98	·25
5·7	—	—	—	·17	10·8	—	·38	·15	·70
5·7	—	—	1·90	·13	16·0	—	·45	·45	·69
—	—	—	—	—	4·9	·23	1·59	1·21	·74
15·2	—	1·90	—	1·10	18·0	·61	·45	·08	1·37
51·2	—	1·90	—	2·56	61·2	·45	·76	·15	2·44
15·2	—	—	—	2·71	35·8	—	·30	·15	4·55
1·9	—	—	—	·04	2·0	·23	·23	·15	·25
30·3	—	1·90	—	2·96	86·0	·07	·53	·45	6·77
7·6	—	3·79	1·90	·48	8·3	—	·30	·23	·49
15·2	—	—	—	·48	29·8	—	·08	—	1·33
24·7	—	—	—	2·09	42·5	—	·08	·08	2·17
—	1·90	—	—	—	·8	·68	—	—	·03
93·0	—	—	—	5·18	85·2	·45	·15	·15	3·67
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·2	—	—	—	—
—	—	—	—	—	2·6	—	—	—	·11
—	—	—	—	—	—	—	—	—	—
641·4	7·59	43·64	15·18	45·96	1124·9	6·66	18·33	9·01	72·03

ABSTRACT No. XVIII.—TABLE showing the AVERAGE STRENGTH, ADMIS- among the TROOPS stationed in INDIA during the year 1900, with the

Average Strength, 60,553. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent home.	Invalids. Number finally discharged the service.	Average Number constantly Sick.
GENERAL DISEASES.							
Small-pox	36	3	—	3	—	—	3·53
Other Eruptive Fevers	57	—	—	—	—	—	3·73
Plague	6	1	—	1	—	—	1·14
Influenza	237	1	—	1	—	—	10·07
Diphtheria	3	—	—	—	1	—	·55
Enteric Fever	970	289	—	289	36	—	140·70
Other Continued Fevers	1,479	2	—	2	4	—	67·12
Cholera	107	88	—	88	—	—	1·79
Dysentery	1,561	52	6	58	67	2	106·00
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	19,445	50	12	62	190	14	710·67
Septic Diseases	44	3	—	3	1	1	3·12
Tubercular Diseases	225	39	17	56	102	49	41·77
Syphilis, Primary	2,597	—	—	—	1	—	282·77
,, Secondary	3,786	13	2	15	344	59	389·06
Gonorrhœa	7,624	1	—	1	35	5	621·21
Hydrophobia	3	4	—	4	—	—	·05
Parasitic Diseases	541	—	—	—	1	—	21·26
Scurvy	4	—	—	—	—	—	·17
Alcoholism	222	2	—	2	1	—	8·34
Rheumatism	1,332	1	—	1	73	23	94·54
Debility	1,482	—	2	2	216	27	109·13
Other General Diseases	448	7	1	8	33	10	32·25
LOCAL DISEASES							
Diseases of the—							
Nervous System (Nervous)	412	24	—	24	65	58	32·19
Nervous System (Mental)	103	—	1	1	77	117	27·83
Eye	650	—	—	—	45	17	41·79
Other Organs of Special Sense	783	—	—	—	69	32	47·04
Circulatory System	738	33	2	35	241	189	74·29
Respiratory ,,	1,517	30	2	32	48	11	95·10
Digestive ,,	5,984	127	—	127	164	28	278·99
Lymphatic ,,	1,491	1	—	1	13	2	178·72
Urinary ,,	126	7	—	7	17	9	13·18
Generative ,,	4,863	—	—	—	15	1	400·17
Organs of Locomotion	616	—	—	—	55	16	43·67
Connective Tissue	1,198	2	—	2	7	2	63·98
Skin	2,706	1	—	1	8	—	129·04
INJURIES.							
General	201	64	—	64	5	7	9·43
Local	5,366	30	—	30	60	27	256·16
In Action	—	—	—	—	—	—	—
POISONS	103	10	—	10	32	1	4·02
No appreciable disease	132	—	—	—	—	—	6·64
Details not available	—	—	—	—	—	—	—
General Total	69,225	885	45	930	2,026	677	4342·21

stons into Hospital, Deaths, Numbers Invalided and Constantly Sick Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.					Average Ratio per 1,000 from 1890 to 1899.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
·6	·03	—	—	·06	·4	·05	—	—	·04
·9	—	—	—	·06	1·2	·02	—	—	·07
·1	·02	—	—	·02	·0	·01	—	—	—
3·9	·02	—	—	·17	9·3	·03	—	—	·34
·0	—	·01	—	·01	—	·01	—	—	—
16·0	4·77	·59	—	2·42	23·8	6·26	·50	·02	3·43
24·4	·03	·07	—	1·11	39·1	·02	·04	·01	1·69
1·3	1·45	—	—	·03	1·4	1·00	·01	—	·03
25·8	·96	1·11	·03	1·78	27·9	·72	1·12	·19	1·94
—	—	—	—	—	—	—	—	—	—
321·1	1·02	3·14	·23	11·74	357·8	·69	3·02	·52	12·40
·7	·05	·02	·02	·05	1·7	·11	·01	—	·11
3·7	·92	1·68	·81	·69	4·2	·83	1·70	1·23	·75
42·9	—	·02	—	4·34	125·5	—	·04	—	11·22
62·5*	·25	5·68	·97	6·59	77·1	·20	5·19	2·11	8·06
125·9	·02	·58	·08	10·26	169·7	—	·27	·13	12·90
·0	·07	—	—	·00	—	·04	—	—	—
8·9	—	·02	—	·35	10·4	·01	—	—	·36
·1	—	—	—	·00	·3	—	·01	—	·02
3·7	·03	·02	—	·14	4·7	·07	·02	·01	·17
22·0	·02	1·21	·38	1·56	29·8	·04	·98	·40	2·15
24·5	·03	3·57	·45	1·79	21·8	·02	3·03	1·27	1·48
7·4	·13	·54	·17	·53	8·3	·15	·48	·15	·58
6·8	·40	1·07	·96	·53	7·6	·32	1·00	·80	·53
1·7	·01	1·27	1·93	·46	1·5	·02	1·20	1·31	·43
10·7	—	·74	·28	·69	11·7	—	·53	·47	·74
12·9	—	1·14	·53	·78	15·4	·01	·92	·77	·83
12·2	·58	3·98	2·62	1·23	10·1	·44	2·76	2·50	1·05
25·1	·53	·79	·18	1·57	32·4	·90	·54	·25	1·83
98·8	2·10	2·71	·46	4·61	120·5	1·75	2·00	·64	5·42
24·6	·02	·21	·03	2·95	32·5	·03	·37	·14	3·73
2·1	·12	·28	·15	·22	2·0	·18	·33	·20	·21
80·3	—	·25	·02	6·61	84·9	·01	·23	·17	6·34
10·7	—	·91	·26	·72	9·7	·02	·84	·64	·74
19·8	·03	·12	·03	1·06	22·6	·01	·10	·04	1·09
44·7	·02	·13	—	2·13	58·1	—	·15	·06	2·49
3·3	1·06	·08	·12	·16	3·8	1·29	·12	·07	·20
88·6	·50	·99	·45	4·23	98·7	·68	·95	·64	4·52
—	—	—	—	—	—	·01	—	·14	—
1·7	·17	·53	·02	·07	·6	·09	·04	—	·02
2·2	—	—	—	·11	2·2	—	—	—	·10
—	—	—	—	—	—	—	—	—	·24
1143·2	15·36	33·46	11·18	71·71	1429·2	16·04	28·50	14·88	88·18

ABSTRACT No. XIX.—TABLE showing the PREVALENCE and MORTALITY INDIA COMMAND with the ratios per 1,000 of Strength, during the year 1900

Military Districts.	Presidency.		Allahabad.		Oudh.		Rohilkhand.		Narbudda.	
Average Strength.	2,766		2,032		3,717		2,500		1,184	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
GENERAL DISEASES.										
Small-pox	—	—	—	—	1	—	—	—	—	—
Other Eruptive Fevers	12	—	1	—	1	—	—	—	2	—
Plague	—	—	—	—	—	—	—	—	—	—
Influenza	109	—	—	—	28	—	—	—	10	—
Diphtheria	—	—	—	—	—	—	2	—	—	—
Enteric Fever	15	2	34	8	75	15	20	3	10	6
Other Continued Fevers	63	—	95	—	233	—	54	—	22	—
Cholera	3	3	6	5	1	—	—	—	1	1
Dysentery	133	10	55	1	64	3	66	—	39	1
Yellow Fever	—	—	—	—	—	—	—	—	—	—
Malarial Fevers	1,140	3	590	1	884	—	246	—	555	—
Septic Diseases	1	—	—	—	3	1	1	—	—	—
Tubercular Diseases	18	6	11	1	13	2	7	—	4	2
Syphilis, Primary	140	—	36	—	180	—	151	—	26	—
,, Secondary	158	1	91	—	183	—	180	1	82	—
Gonorrhœa	300	—	239	—	546	1	272	—	211	—
Hydrophobia	1	1	—	—	—	1	—	—	1	1
Parasitic Diseases	16	—	30	—	34	—	15	—	13	—
Scurvy	1	—	—	—	—	—	—	—	1	—
Alcoholism	10	—	5	1	16	—	4	—	6	—
Rheumatism	25	—	22	—	47	—	35	—	23	1
Debility	101	—	28	—	67	—	52	—	12	—
Other General Diseases	16	1	15	—	27	1	16	—	6	—
LOCAL DISEASES.										
Disease of the—										
Nervous System { Nervous Diseases	22	2	9	2	28	1	13	—	5	—
Nervous System { Mental ,,	6	—	6	—	5	—	3	—	—	—
Eye	14	—	12	—	39	—	18	—	10	—
Other Organs of Special Sense	40	—	31	—	65	—	34	—	24	—
Circulatory System	27	1	24	1	49	2	27	1	6	1
Respiratory ,,	87	2	35	1	78	—	48	1	26	1
Digestive ,,	216	10	168	6	328	8	236	7	135	4
Lymphatic and Glandular System	72	—	59	—	64	—	58	—	31	—
Urinary System	2	—	10	—	4	1	4	—	1	—
Generative System	182	—	217	—	240	—	57	—	185	—
Organs of Locomotion	21	—	30	—	32	—	36	—	10	—
Connective Tissue	45	—	44	—	73	—	17	—	32	—
Skin	86	—	82	—	166	—	78	—	61	—
INJURIES.										
General	5	3	12	2	6	2	2	2	1	1
Local	219	1	145	1	275	2	201	—	105	1
In Action	—	—	—	—	—	—	—	—	—	—
POISONS	2	—	—	—	11	4	1	—	—	—
No appreciable disease	8	—	6	—	12	—	4	—	1	—
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—	—	—	—
General Total	3,316	53	2,148	30	3,928	44	2,018	15	1,667	20

he DIFFERENT CLASSES of DISEASES in each of the MILITARY DISTRICTS in the

del-hi.	Meerut.		Sirhind.		Lahore.		Rawal Pindi.		Peshawar.		Madras.		Southern District.		Banga-lore.		Belgaum	
)4	3,426		3,213		4,451		5,861		2,608		1,045		1,165		647		1,518	
Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
—	2	—	—	—	2	—	—	—	1	—	1	—	1	—	—	—	—	—
—	7	—	1	—	8	—	1	—	—	—	—	—	—	—	1	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	2	—
—	12	—	23	—	—	—	2	—	—	—	—	—	9	—	8	—	13	—
—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
14	41	14	54	15	61	17	91	20	50	20	4	5	7	3	5	1	11	7
1	66	—	14	—	83	—	6	—	73	—	26	—	44	—	24	—	8	—
—	9	9	2	2	20	16	—	—	1	1	1	1	—	—	—	—	—	—
1	48	3	112	5	84	5	62	—	33	—	18	—	21	2	20	1	54	1
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4	1,322	2	1,077	4	3,070	12	692	1	900	3	231	—	273	—	123	—	537	3
1	3	—	8	—	3	—	2	—	5	—	—	—	1	—	—	—	1	—
1	12	4	12	2	11	2	18	3	7	2	13	1	2	—	2	—	5	1
—	81	—	137	—	187	—	258	—	55	—	51	—	25	—	93	—	32	—
—	164	—	171	1	223	2	406	—	134	—	118	—	119	—	91	—	152	—
—	325	—	220	—	444	—	653	—	321	—	104	—	117	—	108	—	228	—
—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—
—	32	—	14	—	27	—	21	—	20	—	12	—	17	—	3	—	24	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	17	—	16	—	20	1	33	—	5	—	2	—	2	—	2	—	5	—
—	92	—	108	—	102	—	180	—	79	—	38	—	18	—	15	—	53	—
—	108	—	116	—	262	—	50	—	104	—	48	—	42	—	22	—	25	—
—	30	—	12	—	22	—	17	—	21	—	11	—	12	—	5	—	38	—
1	24	1	23	2	21	1	25	1	12	1	15	1	18	—	7	1	7	—
—	3	—	7	—	12	—	19	—	4	—	1	—	—	—	3	—	2	—
—	48	—	22	—	72	—	57	—	41	—	7	—	5	—	7	—	20	—
—	67	—	38	—	60	—	49	—	34	—	23	—	11	—	7	—	17	—
—	37	2	31	—	112	2	42	3	28	—	23	1	12	—	8	—	19	2
1	68	—	133	3	148	5	107	4	50	1	44	—	43	2	5	—	36	—
3	412	7	418	6	514	8	374	8	192	—	93	2	149	3	64	1	136	1
—	92	1	54	—	84	—	150	—	45	—	75	—	14	—	15	—	53	—
—	15	1	7	—	5	2	13	2	3	—	2	—	6	—	1	—	1	—
—	392	—	122	—	221	—	326	—	182	—	155	—	50	—	15	—	176	—
—	46	—	43	—	33	—	38	—	25	—	12	—	27	—	3	—	13	—
—	54	—	62	1	85	—	114	—	47	—	35	—	31	—	17	—	48	—
—	192	—	129	—	295	—	187	—	120	—	73	1	37	—	45	—	62	—
8	25	4	4	3	42	9	8	4	14	1	1	1	4	1	—	—	1	4
—	337	6	386	1	387	2	503	—	242	2	115	—	93	—	105	—	210	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1	1	—	32	—	7	1	6	—	23	—	—	1	—	—	—	—	3	—
—	6	—	7	—	10	—	11	—	5	—	1	—	1	—	—	—	1	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
36	4,191	54	3,648	45	6,737	85	4,522	47	2,876	31	1,403	14	1,211	11	825	4	1,993	19

ABSTRACT No. XIX. (continued).—TABLE showing the PREVALENC
DISTRICTS in the INDIA COMMAND, with the ratios per 1,000 of St

Military Districts.	Secunderabad.		Rangoon.		Mandalay.		Poona.	
Average strength.	2,542		1,423		1,316		3,733	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
GENERAL DISEASES.								
Small-pox	3	—	—	—	—	—	4	—
Other Eruptive Fevers	1	—	2	—	—	—	5	—
Plague	—	—	—	—	—	—	—	—
Influenza	—	—	15	1	—	—	6	—
Diphtheria	—	—	—	—	—	—	—	—
Enteric Fever	77	25	10	5	3	1	83	24
Other Continued Fevers	102	—	21	—	2	—	99	—
Cholera	24	20	—	—	—	—	14	13
Dysentery	115	4	50	2	33	—	130	3
Yellow Fever	—	—	—	—	—	—	—	—
Malarial Fevers	361	—	372	4	1,337	6	576	1
Septic Diseases	1	—	—	—	—	—	1	—
Tubercular Diseases	6	1	5	1	3	—	8	—
Syphilis, Primary	92	—	82	—	128	—	215	—
,, Secondary	140	2	156	2	90	—	272	—
Gonorrhœa	443	—	197	—	107	—	687	—
Hydrophobia	—	—	—	—	—	—	—	—
Parasitic Diseases	16	—	24	—	29	—	59	—
Scurvy	—	—	—	—	—	—	—	—
Alcoholism	4	—	8	—	3	—	12	—
Rheumatism	53	—	33	—	35	—	54	—
Debility	86	—	20	—	34	—	51	—
Other General Diseases	14		24	4	29	—	33	1
LOCAL DISEASES.								
Diseases of the—								
Nervous System { Nervous Diseases	25	2	9	—	13	—	18	—
Nervous System { Mental ,,	8	—	1	—	1	—	2	—
Eye	14	—	14	—	15	—	57	—
Other Organs of Special Sense	33	—	21	—	23	—	32	—
Circulatory System	23	2	19	—	31	7	26	2
Respiratory ,,	41	2	47	—	38	1	59	—
Digestive ,,	221	3	166	6	142	5	344	7
Lymphatic and Glandular System	110	—	65	—	25	—	88	—
Urinary System	3	—	6	—	6	—	11	1
Generative System	297	—	196	—	50	—	293	—
Organs of Locomotion	29	—	21	—	13	—	37	—
Connective Tissue	63	—	41	1	24	—	91	—
Skin	138	—	97	—	66	—	138	—
INJURIES.								
General	8	2	3	1	4	2	1	—
Local	295	—	90	1	105	1	333	2
In Action	—	—	—	—	—	—	—	—
POISONS	2	1	—	—	4	—	2	—
No appreciable disease	10	—	5	—	1	—	16	—
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—	—
General Total	2,858	64	1,820	28	2,394	23	3,857	54

MORTALITY of the DIFFERENT CLASSES OF DISEASES in each of the MILITARY during the year 1900—concluded.

Bombay.		Deesa.		Aden.		Sind.		Nagpur.		Quetta.		Marching.		Total.	
1,600		483		1,106		1,475		1,111		2,543		1,434		60.553	
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
2	—	—	—	—	—	—	—	10	1	—	—	—	—	6	1
1	—	—	—	1	—	—	—	2	—	4	—	—	—	36	3
—	—	—	—	1	1	—	—	—	—	—	—	1	—	57	—
2	—	—	—	—	—	—	—	—	—	—	—	—	—	237	1
—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—
8	4	6	3	6	5	2	1	13	4	129	29	5	—	970	289
2	—	8	—	46	—	6	—	221	1	2	—	4	—	1,479	2
2	—	3	2	—	—	—	—	—	—	—	—	—	—	107	88
56	2	23	—	47	1	25	1	25	—	21	1	34	—	1,561	52
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
430	2	274	1	845	1	636	1	296	—	331	—	151	—	19,445	50
2	—	—	—	—	—	1	—	3	—	2	—	—	—	44	3
45	7	1	—	2	—	9	1	—	—	3	—	1	—	225	39
75	—	17	—	8	—	39	—	32	—	154	—	34	—	2,597	—
177	—	42	—	27	1	94	1	52	—	196	—	40	—	3,786	13
184	—	130	—	29	—	122	—	167	—	241	—	118	—	7,624	1
—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	4
17	—	1	—	37	—	35	—	7	—	6	—	2	—	541	—
—	—	—	—	—	—	1	—	—	—	—	—	—	—	4	—
6	—	2	—	10	—	3	—	6	—	3	—	—	—	222	2
38	—	10	—	19	—	13	—	21	—	108	—	18	—	1,332	1
55	—	3	—	57	—	22	—	18	—	9	—	10	—	1,482	—
13	—	3	—	7	—	8	—	9	—	9	—	2	—	448	7
29	—	3	—	8	—	15	2	6	3	8	—	5	1	412	24
8	—	—	—	—	—	3	—	—	—	—	—	1	—	100	—
20	—	8	—	9	—	12	—	11	—	24	—	3	—	650	—
11	—	1	—	21	—	26	—	28	—	10	—	3	—	783	—
52	—	7	—	10	1	15	—	1	—	11	2	5	—	738	33
46	2	5	—	28	—	35	1	20	2	58	1	18	—	1,517	30
147	6	41	3	135	2	151	2	105	—	222	6	66	1	5,984	127
35	—	12	—	11	—	13	—	37	—	20	—	33	—	1,491	1
9	—	1	—	2	—	—	—	2	—	1	—	—	—	126	7
117	—	94	—	21	—	66	—	109	—	133	—	121	—	4,863	—
30	—	3	—	12	—	21	—	7	—	10	—	10	—	646	—
28	—	5	—	31	—	31	—	25	—	25	—	22	—	1,198	2
64	—	19	—	114	—	82	—	96	—	40	—	29	—	2,706	1
2	2	1	1	6	4	2	—	4	—	1	1	3	1	201	64
108	1	34	1	115	1	150	1	113	1	151	—	59	2	5,366	30
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1	—	1	—	1	—	—	1	2	—	1	—	—	—	103	10
1	—	—	—	1	—	2	—	3	—	7	—	1	—	132	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1,822	26	756	11	1,667	17	1,690	12	1,451	12	1,859	40	799	5	69,225	885

Ratios per 1,000 of

Military Districts.	Secunderabad.		Rangoon.		Mandalay.		Poona.		Mhow.	
Average Strength	2,542		1,423		1,346		3,733		2,980	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
GENERAL DISEASES.										
Small-pox	1·2	—	—	—	—	—	1·1	—	2·7	·67
Other Eruptive Fevers	·4	—	1·4	—	—	—	1·3	—	2·0	—
Plague	—	—	—	—	—	—	—	—	—	—
Influenza	—	—	10·5	·70	—	—	1·6	—	—	—
Diphtheria	—	—	—	—	—	—	—	—	—	—
Enteric Fever	30·3	9·83	7·0	3·51	2·2	·74	22·2	6·43	35·6	10·40
Other Continued Fevers	40·1	—	14·8	—	1·5	—	26·5	—	15·8	—
Cholera	9·4	7·87	—	—	—	—	3·8	3·48	6·4	5·03
Dysentery	45·2	1·57	35·1	1·41	24·5	—	34·8	·80	43·3	1·68
Yellow Fever	—	—	—	—	—	—	—	—	—	—
Malarial Fevers	142·0	—	261·4	2·81	993·3	4·46	154·3	·27	517·1	·34
Septic Diseases	·4	—	—	—	—	—	·3	—	1·0	·34
Tubercular Diseases	2·4	·39	3·5	·70	2·2	—	2·1	—	1·7	·67
Syphilis, Primary	36·2	—	57·6	—	95·1	—	57·6	—	48·7	—
,, Secondary	55·1	·79	109·6	1·41	66·9	—	72·9	—	73·2	·67
Gonorrhœa	174·3	—	138·4	—	79·5	—	184·0	—	209·7	—
Hydrophobia	—	—	—	—	—	—	—	—	—	—
Parasitic Diseases	6·3	—	16·9	—	21·5	—	15·8	—	7·7	—
Scurvy	—	—	—	—	—	—	—	—	·3	—
Alcoholism	1·6	—	5·6	—	2·2	—	3·2	—	3·7	—
Rheumatism	20·8	—	23·2	—	26·0	—	14·5	—	18·1	—
Debility	33·8	—	14·1	—	25·3	—	13·7	—	14·1	—
Other General Diseases	5·5	—	16·9	2·81	21·5	—	8·8	·27	13·4	—
LOCAL DISEASES.										
Diseases of the—										
Nervous System { Nervous	9·8	·79	6·3	—	9·7	—	4·8	—	7·7	·67
Nervous System { Mental	3·1	—	·7	—	·7	—	·5	—	1·0	—
Eye	5·5	—	9·8	—	11·1	—	15·3	—	25·8	—
Other Organs of Special Sense	13·0	—	14·8	—	17·1	—	8·6	—	14·8	—
Circulatory System	9·0	·79	13·4	—	23·0	5·20	7·0	·54	22·8	1·01
Respiratory ,,	16·1	·79	33·0	—	28·2	·74	15·8	—	35·9	—
Digestive	86·9	1·18	116·7	4·22	105·5	3·71	92·2	1·88	195·0	4·03
Lymphatic and Glandular System	43·3	—	45·7	—	18·6	—	23·6	—	36·2	—
Urinary System	1·2	—	4·2	—	4·5	—	2·9	·27	2·0	—
Generative System	116·8	—	137·7	—	37·1	—	78·5	—	150·0	—
Organs of Locomotion	11·4	—	14·8	—	9·7	—	9·9	—	19·8	—
Connective Tissue	24·8	—	28·8	·70	17·8	—	24·4	—	21·5	—
Skin	54·3	—	68·2	—	49·0	—	37·0	—	42·3	—
INJURIES.										
General	3·1	·79	2·1	·70	3·0	1·49	·3	—	5·0	1·68
Local	116·0	—	63·2	·70	78·0	·74	89·2	·54	122·8	1·01
In Action	—	—	—	—	—	—	—	—	—	—
POISONS	0·8	·39	—	—	3·0	—	·5	—	·7	·34
No appreciable disease	3·9	—	3·5	—	·7	—	4·3	—	1·7	—
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—	—	—	—
General Total	1124·3	25·18	1279·0	19·68	1778·6	17·09	1033·2	14·47	1719·5	28·52

ean Strength.

	Sirhind.		Lahore.		Rawal Pindi.		Peshawar.		Madras.		Southern District.		Bangalore.		Belgaum.	
	3,213		4,451		5,861		2,608		1,045		1,165		687		1,118	
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
	—	—	·4	—	—	—	·4	—	1·0	—	·9	—	—	—	—	—
	·3	—	1·8	—	·2	—	—	—	—	—	—	—	1·5	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	2·9	—	1·3	—
	7·2	—	—	—	·3	—	—	—	—	—	7·7	—	11·6	—	8·6	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9	16·8	4·67	13·7	3·82	15·5	3·41	19·2	7·67	3·8	4·78	6·0	2·58	7·3	1·46	7·2	4·61
	4·4	—	18·6	—	1·0	—	28·0	—	24·9	—	37·8	—	34·9	—	5·3	—
3	·6	·62	4·5	3·59	—	—	·4	·36	1·0	·96	—	—	—	—	—	—
5	24·9	1·56	18·9	1·12	10·6	—	12·7	—	17·2	—	18·0	1·72	29·1	1·46	35·6	·66
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5	335·2	1·24	689·7	2·70	118·1	·17	345·1	1·15	268·9	—	234·3	—	179·0	—	353·8	1·98
	2·5	—	·7	—	·3	—	1·9	—	—	—	·9	—	—	—	·7	—
7	3·7	·62	2·5	·45	3·1	·51	2·7	·77	12·4	·96	1·7	—	2·9	—	3·3	·66
	42·6	—	42·0	—	44·0	—	21·1	—	48·8	—	21·5	—	135·4	—	21·1	—
	53·2	·31	50·1	·45	69·3	—	51·4	—	112·9	—	102·1	—	132·5	—	100·1	—
	77·8	—	99·6	—	111·4	—	123·1	—	99·5	—	100·4	—	157·2	—	150·2	—
	—	—	—	—	·2	·17	—	—	—	—	—	—	—	—	—	—
	4·4	—	6·1	—	3·6	—	7·7	—	11·5	—	14·6	—	4·4	—	15·8	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	5·0	—	4·5	·22	5·6	—	1·9	—	1·9	—	1·7	—	2·9	—	3·3	—
	33·6	—	22·9	—	30·7	—	30·3	—	36·4	—	15·5	—	21·8	—	34·9	—
	36·1	—	58·9	—	8·5	—	39·9	—	45·9	—	36·1	—	32·0	—	16·5	—
	3·7	—	4·9	—	2·9	—	8·1	—	10·5	—	10·3	—	7·3	—	25·0	—
9	7·2	·62	4·7	·22	4·3	·17	4·6	·38	14·4	·96	15·5	—	10·2	1·46	4·6	—
	2·2	—	2·7	—	3·2	—	1·5	—	1·0	—	—	—	4·4	—	1·3	—
	6·8	—	16·2	—	9·7	—	15·7	—	6·7	—	4·3	—	10·2	—	13·2	—
	11·8	—	13·5	—	8·4	—	13·0	—	22·0	—	9·4	—	10·2	—	11·2	—
8	10·6	—	25·2	·45	7·2	·51	10·7	—	22·0	·96	10·3	—	11·6	—	12·5	1·32
	41·4	·93	33·2	1·12	18·3	·68	19·2	·38	42·1	—	36·9	1·72	7·3	—	23·7	—
4	130·1	1·87	115·5	1·80	63·8	1·36	73·6	—	89·0	1·91	127·9	2·58	93·2	1·46	89·6	·66
9	16·8	—	18·9	—	25·6	—	17·3	—	71·8	—	12·0	—	21·8	—	34·9	—
9	2·2	—	1·1	·45	2·2	·34	1·2	—	1·9	—	5·2	—	1·5	—	·7	—
	38·0	—	49·7	—	55·6	—	69·8	—	148·3	—	42·9	—	21·8	—	115·9	—
	13·4	—	7·4	—	6·5	—	9·6	—	11·5	—	23·2	—	4·4	—	8·6	—
	19·3	·31	19·1	—	19·4	—	18·0	—	33·5	—	26·6	—	24·7	—	31·6	—
	40·1	—	66·3	—	31·9	—	46·0	—	69·9	·96	31·8	—	65·5	—	40·8	—
7	1·2	·93	9·4	2·02	1·4	·68	5·4	·38	1·0	·96	3·4	·86	—	—	·7	2·64
5	120·1	·31	86·9	·45	85·8	—	92·8	·77	110·0	—	79·8	—	152·8	—	138·3	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	10·0	—	1·6	·22	1·0	—	8·8	—	—	·96	—	—	—	—	·7	—
	2·2	—	2·2	—	1·9	—	1·9	—	1·0	—	·9	—	—	—	2·0	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6	1135·4	14·01	1513·6	19·10	771·5	8·02	1102·8	11·89	1342·6	13·40	1039·5	9·44	1202·3	5·82	1312·9	12·52

ABSTRACT No. XX.—TABLE showing the ADMISSIONS and DEATHS which took place at the CHIEF STATIONS in INDIA during the year 1900.

Districts.	Stations.	Average Annual Strength.	Admitted into Hospital.	Died in and out of Hospital.	Ratio per 1,000 of Strength.		Ratio per 1,000 of Strength, 1890 to 1899.	
					Admissions.	Deaths.	Admissions.	Deaths.
PRESIDENCY ...	Fort William ...	1,104	1,360	10	1231·9	9·06	1395·2	8·46
	Fort Fulta	8	1	—	125·0	—	825·6	—
	Fort Chingrikhal ...	34	13	—	382·4	—	1057·7*	3·85
	Dum Dum	702	870	16	1239·3	22·79	1500·9	22·02
	Barrackpore ...	306	675	17	2205·9	55·56	2327·6	26·18
	Lebong	279	190	2	681·0	7·17	653·4†	7·58
	Darjeeling	333	207	8	621·6	24·02	1026·1	12·68
ALLAHABAD ...	Allahabad	818	762	15	931·5	18·34	1504·9	22·17
	Fort Allahabad ...	188	251	2	1335·1	10·64	1694·2	15·26
	Dinapore	645	637	8	987·6	12·40	1720·3	15·96
	Benares	351	498	5	1307·1	13·12	1825·2	21·84
OUDH	Lucknow	2,005	2,108	34	1051·4	16·96	1353·8	23·76
	,, Military Prison	35	51	1	1457·1	28·57	1216·9	14·46
	Fyzabad	267	280	1	1048·7	3·75	1451·7	14·17
	Sitapur	454	251	1	552·9	2·20	1247·5	29·43
	Fatehgarh	212	301	2	1419·8	9·43	1416·2	14·29
	Cawnpore	744	937	5	1259·4	6·72	1475·5	20·52
ROHILKHAND ...	Bareilly	1,122	1,117	6	994·5	5·35	1369·3	14·64
	Shahjahanpur ...	10	17	—	1700·0	—	1636·6	13·90
	Ranikhet	949	635	7	669·1	7·38	1274·2	12·74
	Chaubuttia	281	144	1	512·5	3·56	1284·4	8·23
	Naini Tal	138	105	1	760·9	7·25	1168·4	22·06
NARBUDDA ...	Jubbulpore ...	772	1,186	14	1536·3	18·13	1723·6	18·76
	Saugor	307	410	6	1335·5	19·54	1866·4	11·25
	Pachmarhi	105	71	—	676·2	—	1538·7	22·79
BUNDELKHAND	Agra	1,212	1,201	13	990·9	10·73	1420·4	21·59
	Nowgong	398	375	9	942·2	22·61	2168·2	11·18
	Jhansi	994	1,074	14	1080·5	14·08	1847·6	24·78

* 9 years (1891-99). † 2 years (1898 and 1899).

Districts.	Stations.	Average Annual Strength.	Admitted into Hospital.	Died in and out of Hospital.	Ratio per 1,000 of Strength.		Ratio per 1,000 of Strength, 1890 to 1899.	
					Admissions.	Deaths.	Admissions.	Deaths.
MEERUT ...	Meerut	1,335	1,955	25	1464·4	18·73	1626·1	19·31
	Mutra	77	110	2	1428·6	25·97	1544·1	19·21
	Delhi	313	778	15	2485·6	47·92	2125·0	25·92
	Roorkee	366	344	7	939·9	19·13	1074·8	15·02
	Chakrata	1,126	680	2	603·9	1·78	1126·6	11·56
	Landour	209	324	3	1550·2	14·35	1243·8	23·99
SIRHIND ...	Umballa	1,471	1,688	18	1147·5	12·24	1253·2	17·13
	Dagshai	561	329	3	586·5	5·35	1150·2	14·08
	Solon	141	96	3	680·9	21·28	1179·8	11·65
	Subathu	421	564	9	1339·7	21·38	1098·3	15·92
	Jutogh	238	172	—	722·7	...	1115·9	11·02
	Kasauli	381	799	12	2097·1	31·50	1601·0	20·12
LAHORE	Mian Mir	830	1,810	25	2180·7	30·12	2112·7	25·45
	Jullundur	658	622	4	945·3	6·08	1332·3	14·79
	Ferozepore	896	2,001	23	2233·3	25·67	1901·9	18·56
	Fort Lahore... ...	103	173	6	1679·6	58·25	2626·3	42·12
	Amritsar	191	187	4	979·1	20·94	2086·6	17·29
	Multan	908	1,292	15	1422·9	16·52	1626·0	13·61
	Dalhousie	865	652	8	753·8	9·25	1431·6	14·07
RAWAL PINDI ...	Rawal Pindi... ...	2,729	2,129	30	780·1	10·99	1404·0	16·78
	Sialkot	660	622	4	942·4	6·06	1478·7	13·18
	Campbellpore ...	257	240	3	933·9	11·67	1662·5	12·79
	Fort Attock	164	127	1	774·4	6·10	1850·5	24·22
	Khyra Gali	71	50	—	704·2	—	985·3	7·37
	Bara Gali	45	36	—	800·0	—	989·7	7·71
	Kuldana	455	210	—	461·5	—	1052·9	6·01
	Kalabagh	51	50	—	980·4	—	1062·5	12·56
	Camp Gharial ...	406	288	3	709·4	7·39	945·0	9·1.
	,, Thobba ...	439	396	1	902·1	2·28	1067·2	8·76
	,, Upper Topa ...	175	92	2	525·7	11·43	725·2*	15·2.
	,, Lower Topa ...	59	53	1	898·3	16·95	1121·9	13·09
	Murree	96	58	1	604·2	10·42	1179·6	43·41
	,, Khanspur ...	254	171	1	673·2	3·94	—	—

* 1 year (1899 only).

Districts.	Stations.	Average Annual Strength.	Admitted into Hospital.	Died in and out of Hospital.	Ratio per 1,000 of Strength.		Ratio per 1,000 of Strength, 1890 to 1899.	
					Admissions.	Deaths.	Admissions.	Deaths.
Peshawar ...	Peshawar	1,491	1,577	24	1057·7	16·10	1706·3	31·60
	Nowshera	755	868	7	1149·7	9·27	1672·8	20·24
	Cherat	362	431	—	1190·6	—	1116·9	23·35
Madras	Madras	512	651	4	1271·5	7·81	1475·6	13·27
	St. Thomas Mt. ...	291	327	6	1123·7	20·62	1305·1	14·68
	Pallaveram	81	113	2	1395·1	24·69	1166·7	8·33
	Poonamallee ...	161	312	2	1937·9	12·42	1737·1	31·06
Southern District	Wellington	838	986	4	1176·6	4·77	1151·9	6·53
	Cannanore	94	73	—	776·6	—	1178·1	13·08
	Calicut	88	68	4	772·7	45·45	1188·7	16·80
	Malapuram	145	84	3	579·3	20·69	1195·2	13·37
Bangalore ...	Bangalore	667	826	4	1202·3	5·82	1142·8	9·70
Belgaum ...	Belgaum	1,002	1,239	11	1206·6	10·96	1133·8	5·29
	Bellary	498	744	8	1494·0	16·06	1449·4	10·08
	Ramandroog... ...	18	10	—	555·6	—	1009·4	—
Secunderabad ...	Secunderabad ...	2,542	2,858	64	1124·3	25·18	1181·4	11·05
Rangoon ...	Rangoon	906	1,232	21	1359·8	23·18	1423·6	12·05
	Port Blair	141	101	3	716·3	21·28	900·5	7·01
	Thayetmyo	198	191	2	964·6	10·10	1401·3	8·99
	Meiktila	178	296	2	1662·9	11·24	1347·8	7·37
Mandalay ...	Mandalay	718	1,693	18	2357·9	25·07	1692·9	12·85
	Shwebo	409	406	4	992·7	9·78	1396·2	9·18
	Bhamo	219	295	1	1347·0	4·57	1610·6	9·03
Poona	Poona	2,178	2,093	38	961·0	17·45	1243·7	11·27
	Ahmednagar ...	594	724	8	1218·9	13·47	1218·8	13·28
	Kirkee	677	701	5	1035·5	7·39	1210·2	13·10
	Satara	175	198	1	1131·4	5·71	1346·8	5·05
	Purandhur	109	141	2	1293·6	16·35	1254·9	10·46

Districts.	Stations.	Average Annual Strength.	Admitted into Hospital.	Died in and out of Hospital.	Ratio per 1,000 of Strength.		Ratio per 1,000 of Strength, 1890 to 1899.	
					Admissions.	Deaths.	Admissions.	Deaths.
Mhow	Mhow	1,727	2,754	32	1594·7	18·53	1523·1	13·14
	Nasirabad	781	1,460	32	1869·4	40·97	1484·4	20·02
	Neemuch	297	607	14	2043·8	47·14	1915·2	17·69
	Indore	128	190	2	1484·4	15·62	1457·4	12·31
	Taragarh	47	113	5	2404·3	106·38	1631·3	37·59
Bombay ...	Bombay	1,164	940	15	807·6	12·89	1279·7	11·45
	Deolali	406	824	11	2029·6	27·09	1785·1	14·29
	Khandalla	30	59	—	1966·7	—	1168·8	8·88
Deesa	Deesa	185	367	1	1983·8	5·41	1466·3	12·48
	Ahmedabad	203	245	6	1206·9	29·46	2455·0	23·34
	Mt. Abu	95	146	4	1536·8	42·11	1573·4	19·02
Aden	Aden	1,106	1,667	17	1507·2	15·37	1566·1	12·15
Sind	Karachi	1,034	1,138	8	1100·6	7·74	1796·2	10·25
	Hyderabad	441	552	4	1251·7	9·07	1601·4	10·86
Nagpur ...	Kamptee	1,042	1,405	12	1348·4	11·52	1380·5	10·82
	Sitabaldi	69	46	—	666·7	—	1691·6	7·72
Quetta	Quetta	2,543	1,850	40	727·5	15·73	1439·8	15·71
Marching ...	Troops on the march	1,434	799	5	557·2	3·49	930·0	11·34

ABSTRACT No. XXI.—TABLE showing the STATIONS in INDIA at which the ADMISSIONS and DEATHS from ENTERIC FEVER took place in each of the four quarters of the year 1900.

Districts.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Presidency	Fort William ..	—	—	1	—	—	—	1	1	2	1
	Dum-Dum ..	—	—	5	4	3	2	—	—	8	6
	Barrackpore ..	1	—	1	1	1	1	1	—	4	2
	Darjeeling ..	—	—	1	—	—	—	—	—	1	—
Allahabad	Allahabad ..	6	—	9	4	1	—	1	1	17	5
	Dinapore ..	—	—	—	—	5	1	3	1	8	2
	Benares ..	2	1	3	—	1	—	3	—	9	1
Oudh ..	Lucknow ..	19	6	27	6	7	2	10	1	63	15
	Fyzabad ..	1	—	—	—	—	—	1	—	2	—
	Cawnpore ..	1	—	2	—	1	—	6	—	10	—
Rohilkhand	Bareilly ..	4	—	1	1	—	—	1	—	6	1
	Ranikhet ..	1	—	2	—	9	2	—	—	12	2
	Chaubuttia ..	1	—	1	—	—	—	—	—	2	—
Narbudda	Jubbulpore ..	4	2	4	4	1	—	—	—	9	6
	Saugor	—	—	1	—	—	—	—	—	1	—
Bundelkhand	Agra	1	—	3	1	3	—	12	4	19	5
	Nowgong ..	1	1	5	3	1	1	1	1	8	6
	Jhansi	6	1	3	1	2	—	6	1	17	3
Meerut ..	Meerut	6	1	5	5	5	3	1	1	17	10
	Muttra	—	—	—	—	—	—	1	1	1	1
	Delhi	1	1	4	1	4	1	—	—	9	3
	Chakrata ..	4	—	4	—	4	—	1	—	13	—
	Landour ..	—	—	1	—	—	—	—	—	1	—

District.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Sirhind ..	Umballa ..	10	3	2	1	2	—	7	2	21	6
	Dagshai ..	—	—	3	2	3	—	—	—	6	2
	Solon	—	—	—	—	1	—	—	—	1	—
	Subathu ..	—	—	14	4	1	—	—	—	15	4
	Jutogh	—	—	5	—	—	—	—	—	5	—
	Kasauli	1	—	4	1	1	2	—	—	6	3
Lahore ..	Mian Mir ..	8	—	1	—	3	—	2	—	14	—
	Jullundur ..	2	—	—	—	—	—	1	—	3	—
	Ferozepore ..	2	2	2	2	1	1	2	1	7	6
	Amritsar ..	—	—	1	—	—	1	—	—	1	1
	Multan	3	1	15	2	3	4	—	—	21	7
	Dalhousie ..	—	—	13	2	2	1	—	—	15	3
Rawal Pindi	Rawal Pindi ..	8	2	24	4	17	5	10	1	59	12
	Campbellpore ..	—	—	2	1	—	—	1	—	3	1
	Fort Attock ..	—	—	1	—	1	—	—	—	2	—
	Kuldana ..	—	—	1	—	—	—	—	—	1	—
	Camp Gharial ..	—	—	9	3	3	—	—	—	12	3
	„ Thobba ..	—	—	5	1	—	—	—	—	5	1
	„ Upper Topa.	—	—	—	—	4	1	—	—	4	1
	„ Lower Topa.	—	—	1	1	—	—	—	—	1	1
	Khanspur ..	—	—	3	1	—	—	—	—	3	1
	Murree	—	—	1	—	—	—	—	—	1	—
Peshawar ..	Peshawar ..	4	3	11	6	9	3	5	3	29	15
	Nowshera ..	1	—	12	4	1	—	2	1	16	5
	Cherat	—	—	4	—	1	—	—	—	5	—

Districts.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Madras ..	Madras	1	—	1	2	2	—	—	1	4	3
	Pallaveram ..	—	1	—	—	—	—	—	—	—	1
	Poonamallee .	—	—	—	—	—	1	—	—	—	1
Southern District	Wellington .	—	—	1	—	2	—	—	—	3	—
	Calicut	—	—	1	—	2	2	—	—	3	2
	Malapuram ..	1	—	—	1	—	—	—	—	1	1
Bangalore ..	Bangalore ..	3	—	1	1	1	—	—	—	5	1
Belgaum ..	Belgaum ..	1	2	—	—	5	2	3	2	9	6
	Bellary	—	—	—	—	1	—	1	1	2	1
Secunderabad	Secunderabad ..	8	3	5	1	50	16	14	5	77	25
Rangoon ..	Rangoon ..	—	—	3	2	5	2	1	—	9	4
	Thayetmyo ..	—	—	1	1	—	—	—	—	1	1
Mandalay ..	Mandalay ..	—	—	—	—	1	1	1	—	2	1
	Bhamo	—	—	—	—	1	—	—	—	1	—
Poona ..	Poona	4	—	2	1	30	11	7	4	43	16
	Ahmednagar ..	4	1	3	1	6	2	9	1	22	5
	Kirkee	2	—	1	—	7	1	6	1	16	2
	Satara	1	—	—	1	1	—	—	—	2	1
Mhow	Mhow	9	2	3	—	20	3	3	1	35	6
	Nasirabad ..	14	4	16	6	17	5	9	6	56	21
	Neemuch ..	4	1	1	1	3	1	2	1	10	4
	Indore	—	—	—	—	1	—	—	—	1	—
	Taragarh ..	—	—	3	—	1	—	—	—	4	—
Bombay ..	Bombay ..	1	1	1	—	2	2	—	—	4	3
	Deolali	2	—	1	—	1	1	—	—	4	1
Deesa ..	Deesa	—	—	—	—	3	—	—	—	3	—
	Ahmedabad ..	—	—	—	—	1	1	—	—	1	1
	Mount Abu ..	—	—	—	—	2	1	—	1	2	2

Districts.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Aden	Aden	1	1	—	—	4	4	1	—	6	5
Sind	Hyderabad ..	—	—	2	1	—	—	—	—	2	1
Nagpur ..	Kamptee ..	5	2	1	—	5	2	2	—	13	4
Quetta ..	Quetta	6	—	1	—	47	11	75	18	129	29
Marching ..	Troops on the march.	1	—	—	—	—	—	4	—	5	—
	Total ..	166	42	265	85	322	100	217	62	970	289

ABSTRACT No. XXII.—TABLE showing the STATIONS in INDIA at which the ADMISSIONS and DEATHS from CHOLERA took place in each of the four quarters of the year 1900.

Districts.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Residency	Fort William	1	1	--	—	—	—	—	—	1	1
	Dum Dum ..	1	1	—	—	—	—	—	—	1	1
	Barrackpore ..	—	—	1	1	—	—	—	—	1	1
Allahabad	Allahabad ..	—	—	—	—	2	2	—	—	2	2
	Dinapore ..	—	—	—	—	1	1	—	—	1	1
	Benares ..	—	—	3	2	—	—	—	—	3	2
Oudh	Fyzabad ..	—	—	—	—	1	—	—	—	1	—
Narbudda ..	Jabbulpore ..	—	—	—	—	1	1	—	—	1	1
Bundelkhand ..	Agra	—	—	—	—	1	—	—	—	1	—

Districts.	Stations.	1st Quarter		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Meerut	Meerut ..	—	—	—	—	3	3	—	—	3	3
	Delhi	—	—	3	3	3	3	—	—	6	6
Sirhind ..	Umballa ..	—	—	—	—	—	—	2	2	2	2
Lahore	Mian Mir ..	—	—	—	—	12	9	1	1	13	10
	Fort Lahore ..	—	—	—	—	7	6	—	—	7	6
Peshawar ..	Peshawar ..	—	—	—	—	1	1	—	—	1	1
Madras ..	Madras ..	—	—	—	—	1	1	—	—	1	1
Secunderabad ..	Secunderabad	—	—	—	—	24	20	—	—	24	20
Poona ..	Poona	—	—	—	—	9	9	—	—	9	9
	Ahmednagar ..	—	—	1	1	3	2	—	—	4	3
	Purandhar ..	—	—	1	1	—	—	—	—	1	1
Mhow ..	Mhow ..	—	—	—	—	9	8	—	—	9	8
	Nasirabad ..	—	—	—	—	8	5	—	—	8	5
	Neemuch ..	—	—	2	2	—	—	—	—	2	2
Bombay	Bombay ..	—	—	—	—	1	—	—	—	1	—
	Deolali ..	—	—	—	—	1	—	—	—	1	—
Deesa ..	Ahmednagar ..	—	—	1	1	—	—	—	—	1	1
	Mt. Abu ..	—	—	2	1	—	—	—	—	2	1
	Total ..	2	2	14	12	88	71	3	3	107	88

TRACT No. XXIII.—TABLE showing the PREVALENCE of DYSENTERY, DIARRHŒA, and HEPATIC DISEASES (Congestion, Inflammation, and Abscess of Liver) in each of the DISTRICTS in INDIA during the Year 1900.

Districts.	Strength.	Dysentery.				Diarrhœa.				Hepatic Diseases.				Total.			
		Number.		Ratio per 1,000 of Strength.		Number.		Ratio per 1,000 of Strength.		Number.		Ratio per 1,000 of Strength.		Number.		Ratio per 1,000 of Strength.	
		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
ncy	2,766	133	10	48·1	3·62	49	—	17·7	—	73	9	26·4	3·25	254	19	92·2	6·87
ad	2,032	55	1	27·1	·49	56	—	17·7	—	36	5	17·7	2·46	127	6	62·5	2·95
... ...	3,717	64	3	17·2	·81	38	—	10·2	—	77	7	20·7	1·88	179	10	48·2	2·69
and	2,500	66	—	26·4	—	104	—	41·6	—	55	6	22·0	2·40	225	6	90·0	2·40
da	1,184	39	1	32·9	·84	8	—	6·8	—	42	4	35·5	3·38	89	5	75·2	4·22
khand	2,604	64	1	24·6	·38	21	—	8·1	—	27	2	10·4	·77	112	3	43·0	1·15
... ...	3,426	48	3	14·0	·88	65	1	19·0	·29	49	5	14·3	1·46	162	9	47·3	2·63
... ...	3,213	112	5	34·9	1·56	64	—	19·9	—	86	5	26·8	1·56	262	10	81·5	3·11
... ...	4,451	84	5	18·9	1·12	133	1	29·9	·22	109	6	24·5	1·35	326	12	73·2	2·70
Pindi	5,861	62	—	10·6	—	41	—	7·0	—	59	5	10·1	·85	162	5	27·6	·85
ar	2,609	33	—	12·7	—	43	—	16·5	—	13	—	5·0	—	89	—	34·1	—
... ...	1,045	18	—	17·2	—	5	—	4·8	—	36	2	34·4	1·91	59	2	56·5	1·91
m District ...	1,165	21	2	18·0	1·72	1	—	·9	—	55	2	47·2	1·72	77	4	66·1	3·43
ore	687	20	1	29·1	1·46	6	—	8·7	—	14	1	20·4	1·46	40	2	58·2	2·91
m	1,518	54	1	35·6	·66	3	—	2·0	—	28	1	18·4	·66	85	2	56·0	1·32
erabad	2,542	115	4	45·2	1·57	14	—	5·5	—	34	2	13·4	·79	163	6	64	2·36
m	1,423	50	2	35·1	1·41	3	—	2·1	—	63	6	44·3	4·22	116	8	81·5	5·63
lay	1,346	33	—	24·5	—	—	—	—	—	46	3	34·2	2·23	79	3	58·7	2·23
... ...	3,733	130	3	34·8	·80	76	—	20·4	—	59	6	15·8	1·61	265	9	71·0	2·41
... ...	2,980	129	5	43·3	1·68	205	—	68·8	—	81	10	27·2	3·36	415	15	139·3	5·03
y	1,600	56	2	35·0	1·25	27	—	16·9	—	49	5	30·6	3·13	132	7	82·5	4·38
... ...	483	23	—	47·6	—	12	—	24·8	—	6	3	12·4	6·21	41	3	84·9	6·21
... ...	1,106	47	1	42·5	·90	29	—	26·2	—	25	1	22·6	·90	101	2	91·3	1·81
... ...	1,475	25	1	16·9	·68	39	—	26·4	—	23	1	15·6	·68	87	2	59·0	1·36
r	1,111	25	—	22·5	—	20	—	18·0	—	6	—	5·4	—	51	—	45·9	—
... ...	2,543	21	1	8·3	·39	54	1	21·2	·39	27	3	10·6	1·18	102	5	40·1	1·97
ng	1,434	34	—	23·7	—	13	—	9·1	—	10	1	7·0	·70	57	1	39·7	·70
Total	60,553	1,561	52	25·8	·86	1,109	3	18·3	·05	1,188	101	19·6	1·67	3,858	156	63·7	2·58

ABSTRACT No. LXIV.—Table showing the Prevalence and Mortality in the Cantonments of India, due to Dysentery, Diarrhœa, and Hepatic Diseases in each Quarter of the Year 1900.

—	Strength.	Dysentery.				Diarrhœa.				Hepatic Diseases.				Total.			
		Number.		Ratio per 1,000 of Strength.		Number.		Ratio per 1,000 of Strength.		Number.		Ratio per 1,000 of Strength.		Number.		Ratio per 1,000 of Strength.	
		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
1st Quarter ..	62,239	295	11	4·7	·18	172	1	2·8	·02	264	23	4·2	·37	731	35	11·7	·56
2nd „ ..	61,045	308	8	5·0	·13	249	1	4·1	·02	302	21	4·9	·34	859	30	14·1	·49
3rd „ ..	60,805	540	18	9·0	·30	494	—	8·2	—	358	23	5·9	·38	1,392	41	23·1	·68
4th „ ..	58,623	418	15	7·1	·26	194	1	3·3	·02	264	34	4·5	·58	876	50	14·9	·85
Total ..	60,553	1,561	52	25·8	·86	1,109	3	18·3	·05	1,188	101	19·6	1·67	3,858	156	63·7	2·58

ABSTRACTS XXV–XXX.

ABSTRACT No. XXV.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS the TROOPS stationed in EGYPT and CYPRUS during the Year 1900, with

Average Strength, 3,767. Diseases.	Admissions into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Number sent Home.	Invalids. Number finally Discharged the Service.	Average Number constantly Sick.
GENERAL DISEASES.							
Small-pox	3	—	—	—	—	—	·59
Other Eruptive Fevers	52	—	—	—	—	—	4·68
Influenza	425	—	—	—	1	—	12·42
Diphtheria	2	—	—	—	—	—	·13
Enteric Fever	69	11	—	11	1	—	9·15
Other Continued Fevers	128	1	—	1	1	—	7·61
Cholera	—	—	—	—	—	—	—
Dysentery	59	1	—	1	—	—	3·49
Yellow Fever	—	—	—	—	—	—	—
Malarial Fevers	32	—	—	—	—	—	1·05
Septic Diseases	1	—	—	—	—	—	·04
Tubercular Diseases	10	1	—	1	4	6	1·92
Syphilis, Primary	32	—	—	—	—	—	3·25
,, Secondary	48	—	—	—	1	1	4·33
Gonorrhœa	403	—	—	—	—	—	28·68
Hydrophobia	—	—	—	—	—	—	—
Parasitic Diseases	52	—	—	—	—	—	1·91
Scurvy	—	—	—	—	—	—	—
Alcoholism	2	—	—	—	—	—	·07
Rheumatism	82	—	—	—	2	1	6·29
Debility	29	—	—	—	3	—	2·29
Other General Diseases	29	—	—	—	1	—	1·41
LOCAL DISEASES.							
Diseases of the—							
Nervous System (Nervous)	29	—	—	—	6	4	1·95
Nervous System (Mental)	4	—	—	—	6	6	1·82
Eye	57	—	—	—	4	1	3·46
Other Organs of Special Sense	81	—	—	—	7	2	5·53
Circulatory System	28	2	1	3	9	4	2·73
Respiratory ,,	67	3	—	3	3	—	5·53
Digestive ,,	259	1	—	1	5	—	9·58
Lymphatic ,,	32	—	—	—	—	1	3·45
Urinary ,,	8	—	—	—	1	—	·51
Generative ,,	310	—	—	—	—	—	23·95
Organs of Locomotion	47	—	—	—	4	2	2·45
Connective Tissue	113	—	—	—	1	—	5·61
Skin	133	—	—	—	3	—	6·01
INJURIES.							
General	4	1	—	1	1	1	·85
Local	234	4	—	4	4	1	11·48
In Action	—	—	—	—	—	—	—
POISONS	1	—	—	—	—	—	·01
No appreciable disease	9	—	—	—	—	—	·29
Cause unknown (refers to deaths only)	—	—	—	—	—	—	—
General Total	2,934	25	1	26	68	30	174·55

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.					Average Ratio per 1,000 from 1890 to 1899.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
·8	—	—	—	·16	·4	·02	—	—	·07
13·8	—	—	—	1·24	1·6	—	—	—	·62
112·8	—	·27	—	3·30	5·9	—	·02	—	·18
·5	—	—	—	·03	·2	—	—	—	·02
13·3	2·92	·27	—	2·43	25·2	6·28	7·61	·07	4·32
49·9	·27	·27	—	2·02	88·6	·11	2·48	·09	3·82
—	—	—	—	—	·1	·14	—	—	—
15·7	·27	—	—	·93	19·6	·83	2·25	·20	1·46
—	—	—	—	—	—	—	—	—	—
8·5	—	—	—	·28	27·1	·02	·32	·04	1·06
·3	—	—	—	·01	·9	·05	·02	—	·05
2·7	·27	1·06	1·59	·51	2·9	·72	1·64	1·33	·85
8·5	—	—	—	·86	47·8	—	·07	—	4·43
12·7	—	·27	·27	1·15	47·7	·05	1·13	·50	4·78
107·0	—	—	—	7·61	110·5	—	·20	·14	7·85
—	—	—	—	—	—	—	—	—	—
13·8	—	—	—	·51	9·6	—	—	—	·32
—	—	—	—	—	—	—	·02	—	·01
·5	—	—	—	·02	2·8	·20	·02	—	·14
21·8	—	·53	·27	1·67	25·6	·07	·81	·18	1·85
7·7	—	·80	—	·61	18·4	—	3·78	1·06	1·60
7·7	—	·27	—	·37	7·7	·07	·16	·07	·60
7·7	—	1·59	1·06	·52	8·6	·43	·99	·70	·53
1·1	—	1·59	1·59	·48	1·5	·02	1·35	1·51	·40
15·1	—	1·06	·27	·92	29·5	—	·47	·45	1·59
21·5	—	1·86	·53	1·47	14·3	·02	·52	·47	·89
7·4	·80	2·39	1·06	·72	7·4	·54	1·94	2·25	·99
17·8	·80	·80	—	1·47	36·9	·83	·90	·34	2·37
68·7	·27	1·33	—	2·54	120·5	1·13	1·96	·63	4·73
8·5	—	—	·27	·92	16·6	—	·32	·07	1·93
2·1	—	·27	—	·13	1·5	·05	·22	·13	·20
82·3	—	—	—	6·36	112·0	—	·41	·25	8·16
12·5	—	1·06	·53	·65	9·9	·02	·59	·50	·76
30·0	—	·27	—	1·49	25·0	—	·13	·04	1·31
35·3	—	·80	—	1·60	47·6	—	·18	·07	2·48
1·1	·27	·27	·27	·23	1·4	·90	·38	·07	·15
62·1	1·06	1·06	·27	3·05	86·4	·54	·79	·56	4·41
—	—	—	—	—	·1	·09	1·64	·47	·25
·3	—	—	—	·00	1·0	·11	—	—	·03
2·4	—	—	—	·08	3·0	—	—	—	·15
—	—	—	—	—	—	—	—	—	—
778·9	6·90	18·05	7·96	46·34	965·8	13·24	33·32	12·18	65·32

ABSTRACT No. XXVI.—TABLE showing the AVERAGE STRENGTH, SHIP proceeding on and returning from Service Abroad, and from one during the Year 1900.

Strength of W.O., N.C.O., and Men:	Passage Out.		Passage Home.	
Embarked*	113,619		9,067	
Average Annual Strength...	7,001		693	
	Admitted.	Died.	Admitted.	Died.
GENERAL DISEASES.				
Small-pox	—	—	1	
Other Eruptive Fevers	14	—	1	—
Influenza	712	—	6	—
Diphtheria	—	—	—	—
Enteric Fever...	18	5	23	6
Other Continued Fevers	150	—	24	—
Cholera	—	—	—	—
Dysentery	14	—	16	—
Malarial Fevers	101	1	24	—
Septic Diseases	10	—	—	—
Tubercular Diseases...	70	2		—
Syphilis, Primary	135	—	7	—
,, Secondary	142	—	10	1
Gonorrhœa	765	—	42	—
Hydrophobia	—	—	—	—
Parasitic Diseases	234	—	7	—
Scurvy...	—	—	—	—
Alcoholism	25	—	—	—
Rheumatism	306	1	25	—
Debility	147	—	27	—
Other General Diseases	43	—	2	—
LOCAL DISEASES.				
Diseases of the—				
Nervous System { Nervous	181	4	14	—
Nervous System { Mental	12	—	—	—
Eye	147	—	18	—
Other Organs of Special Sense	136	—	18	—
Circulatory System	46	2	4	—
Respiratory ,, ...	1,495	78	64	—
Digestive ,, ...	3,043	4	156	1
Lymphatic ,, ...	35		10	—
Urinary ,, ...	19	1	2	—
Generative ,, ...	295	—	22	—
Organs of Locomotion	114	—	8	—
Connective Tissue	158	—	16	—
Skin	517	—	30	—
INJURIES.				
General	54	6	1	—
Local	686	—	37	—
In Action	—	—	—	—
POISONS	2	—	1	—
Not yet diagnosed	18	—	—	—
No appreciable disease	—	—	—	—
General Total	9,795	104	616	8

* See footnote on page 254.

Admissions into Hospital, and Deaths among the Troops on Board Colony or Station abroad to another, with the Ratios per 1,000 of the Strength,

Intercolonial.		Ratio per 1,000 of the Strength.					
10,018 489		Passage Out.		Passage Home.		Intercolonial.	
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
—	—	—	—	1·4	—	—	—
—	—	2·0	—	1·4	—	—	—
3	—	101·7	—	8·7	—	6·1	—
—	—	—	—	—	—	—	—
5	1	2·6	·72	33·2	8·66	10·2	2·04
10	—	22·7	—	34·6	—	20·5	—
—	—	—	—	—	—	—	—
4	—	2·0	—	23·1	—	8·2	—
12	—	14·4	·14	34·6	—	24·5	—
3	1	1·4	—	—	—	6·1	2·04
1	—	1·4	·29	—	—	2·0	—
15	—	19·3	—	10·1	—	30·7	—
11	—	20·3	—	14·4	1·44	22·5	—
86	—	109·3	—	60·6	—	175·9	—
—	—	—	—	—	—	—	—
8	—	33·4	—	10·1	—	16·4	—
—	—	—	—	—	—	—	—
1	—	3·6	—	—	—	2·0	—
27	—	43·7	·14	36·1	—	55·2	—
9	—	21·0	—	39·0	—	18·4	—
2	—	6·1	—	2·9	—	4·1	—
9	—	25·9	·57	20·2	—	18·4	—
—	—	1·7	—	—	—	—	—
8	—	21·0	—	26·0	—	16·4	—
11	—	19·4	—	26·0	—	25·5	—
—	—	6·6	·29	5·8	—	—	—
64	1	213·5	11·13	92·4	—	130·9	2·01
88	—	434·7	·57	225·1	1·44	180·0	—
7	—	5·0	—	14·4	—	14·3	—
1	—	2·7	·14	2·9	—	2·0	—
24	—	42·1	—	31·8	—	49·1	—
2	—	16·3	—	11·5	—	4·1	—
27	—	22·6	—	23·1	—	55·2	—
33	—	73·8	—	43·3	—	67·5	—
2	—	7·7	·86	1·4	—	4·1	—
48	—	98·3	—	53·4	—	98·2	—
—	—	—	—	—	—	—	—
1	—	·3	—	1·4	—	2·0	—
—	—	—	—	—	—	—	—
1	—	2·6	—	—	—	2·0	—
523	3	1,399·1	14·85	888·9	11·54	1,069·5	6·13

ABSTRACT No. XXVII.—On the Influence of Age on the Mortality.—Table showing the Death Rates of Warrant Officers, Non-commissioned Officers and Men, at the several Ages, arranged by quinquennial periods, in the several Commands Abroad.

Commands.	Under 20 Years.				20 and under 25.				25 and under 30.				30 and under 35.				35 and under 40.				40 and upwards.			
	Strength.	Died.	Ratio per 1,000.		Strength.	Died.	Ratio per 1,000.		Strength.	Died.	Ratio per 1,000.		Strength.	Died.	Ratio per 1,000.		Strength.	Died.	Ratio per 1,000.		Strength.	Died.	Ratio per 1,000.	
			1900.	1890-99.			1900.	1890-99.			1900.	1890-99.			1900.	1890-99.			1900.	1890-99.			1900.	1890-99.
Gibraltar	937	2	2·13	2·86	2,105	12	5·70	3·28	1,157	4	3·46	2·65	509	5	9·82	5·34	117	—	—	11·28	33	—	—	14·73
Malta	1,578	7	4·44	6·10	3,628	24	6·62	8·42	2,227	10	4·49	7·92	859	8	9·31	8·85	350	3	8·57	11·29	90	1	11·11	24·18
Egypt and Cyprus...	529	1	1·89	7·78	1,384	10	7·23	13·18	1,324	8	6·04	13·00	372	5	13·44	11·63	120	1	8·33	20·12	38	—	—	12·58
Canada	189	1	5·29	·99	802	3	3·74	2·34	488	3	6·15	2·45	179	2	11·17	5·45	68	1	14·71	9·78	42	—	—	8·62
Bermuda	16	—	—	5·93	250	—	—	7·09	238	3	12·61	8·33	79	—	—	13·28	41	—	—	5·52	8	—	—	10·31
Barbados	15	—	—	—	286	2	6·99	5·47	335	3	8·96	8·52	52	—	—	12·35	22	—	—	14·71	4	—	—	48·78
Jamaica	5	—	—	7·09	191	3	15·71	12·81	260	—	—	8·72	75	—	—	10·99	30	—	—	42·11	5	—	—	23·26
West Africa..	—	—	—	—	20	—	—	—	38	—	—	44·10	11	—	—	74·07	8	—	—	117·65	1	—	—	—
South Africa and St. Helena ...	—	—	—	*3·85	—	—	—	*6·75	—	—	—	*6·84	—	—	—	*10·64	—	—	—	*9·16	—	—	—	*6·54
Mauritius	18	—	—	8·16	207	—	—	10·56	167	3	17·96	12·46	44	—	—	16·91	22	—	—	24·39	5	—	—	50·00
Ceylon†	—	—	—	5·73	—	—	—	5·53	—	—	—	9·43	—	—	—	23·28	—	—	—	16·84	—	—	—	25·00
China	36	—	—	10·10	718	8	11·14	9·37	548	12	21·90	9·96	134	1	7·46	18·48	38	2	52·63	16·72	10	—	—	74·63
Straits Settlements	7	—	—	8·22	234	2	8·55	4·80	207	2	9·66	5·70	59	—	—	13·71	14	—	—	8·33	6	—	—	—
India...	1,370	13	9·49	9·34	25,689	401	15·61	18·53	25,235	372	14·74	12·69	5,480	68	12·41	13·41	1,500	22	14·67	14·61	511	9	17·61	29·10

* 1889-98. † Information not furnished by this Command.

ABSTRACT No. XXVIII.—TABLE showing the general HEALTH STATISTICS of the various CORPS which served in the UNITED KINGDOM during the year 1900.

Battery or Battalion.	Corps.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years at Home since last return from Service Abroad.
							Admitted.	Died.	Invalided.	Average Constantly Sick.				
	HOUSEHOLD CAVALRY.										days.	days.		
1st	Life Guards	285	244	2	1	13·55	856·1	7·02	3·51	47·54	17·35	20·27	Windsor, 12 months...	84
2nd	Life Guards	277	178	—	7	9·29	642·6	—	25·27	33·54	12·24	19·05	London, 12 months	84
	Royal Horse Guards	263	127	—	6	9·04	482·9	—	22·81	34·37	12·55	25·98	London, 12 months	84
	Household Cavalry detached	1	1	—	—	—	—	—	—	—	—	—		
	Total Household Cavalry	826	550	2	14	31·88	665·9	2·42	16·95	38·60	14·09	21·16		
	CAVALRY.													
1st	Dragoon Guards	797	711	6	29	38·79	892·0	7·53	36·39	48·67	17·76	19·91	Dublin, 5 months; Aldershot, 7 months	9
2nd	Dragoon Guards	839	577	3	37	29·57	687·7	3·58	44·10	35·24	12·86	18·70	York, 3 months; Aldershot, 9 months ...	4
3rd	Dragoon Guards	784	495	—	17	32·73	631·4	—	21·68	41·75	15·24	24·14	Belfast and Dundalk, 2½ months; Curragh, 9½ months.	5
7th	Dragoon Guards. (Reserve)	493	540	2	24	24·23	1095·3	4·06	48·68	49·15	17·94	16·38	Shorncliffe and Aldershot	—
1st	Royal Dragoons. (Reserve Squadron)	275	265	1	8	14·55	963·6	3·64	29·09	52·91	19·31	20·04	Shorncliffe	—
2nd	Royal Dragoons. (Reserve Squadron)	357	276	1	16	14·73	773·1	2·80	44·82	41·26	15·06	19·48	Piershill	—
6th	Dragoons. (Reserve Squadron)	257	242	—	13	15·55	941·6	—	50·58	60·51	22·08	23·45	Curragh	—

Battery or Battalion.	Corps.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of Strength. Admitted.	Died.	Invalided.	Average Constantly Sick.	Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years at Home since last return from Service Abroad.
	CAVALRY—*cont.*										days.	days.		
7th	Hussars	923	637	5	30	36·29	690·1	5·42	32·50	39·32	14·35	20·79	Norwich, 5 months; Aldershot, 7 months.	—
8th	Hussars	759	412	4	13	15·36	542·8	5·27	17·13	20·24	7·39	13·61	Dundalk and Curragh	—
10th	Hussars. (Reserve Squadron)	400	280	3	11	24·51	700·0	7·50	27·50	61·28	22·36	31·95	Woolwich	—
12th	Lancers. (Reserve Squadron)	421	271	1	9	16·61	643·7	2·38	21·38	39·45	14·40	22·37	Colchester	—
13th	Hussars. (Reserve Squadron)	624	468	4	8	26·32	750·0	6·41	12·82	42·18	15·40	20·53	Hounslow and Norwich	—
14th	Hussars. (Reserve Squadron)	220	275	1	27	19·20	1250·0	4·55	122·73	87·27	31·85	25·48	Curragh	—
17th	Lancers	356	316	4	6	16·19	887·6	11·24	16·85	45·48	16·60	18·70	Cork and Aldershot. To South Africa ...	—
21st	Lancers	786	648	2	26	36·14	824·4	2·54	33·08	45·98	16·78	20·36	Curragh, 5½ months; Dublin, 6½ months	—
	Reserve Regiment Dragoon Guards ...	258	114	5	9	6·77	441·9	19·38	34·88	26·24	9·58	21·68	Newbridge	—
	Reserve Regiment Dragoons	296	258	—	17	11·84	871·6	—	57·43	40·00	14·60	16·75	York	—
	Reserve Regiment Hussars	355	138	3	4	11·28	388·7	8·45	11·27	31·78	11·60	29·84	Hounslow	—
	Reserve Regiment Lancers	349	175	—	5	7·73	501·4	—	14·33	22·15	8·08	16·12	Ballincollig	—
	Cavalry Depôts	1,661	1,439	1	37	58·67	866·3	·60	22·28	35·32	12·89	14·88	Canterbury	—
	Remount Depôts	205	66	—	—	2·87	322·0	—	—	14·00	5·11	15·87	Canterbury and Colchester	—
	Various Regiments	96	120	8	25	11·44	1250·0	83·33	260·42	119·17	43·50	34·90	Various stations	—
	Total Cavalry of the Line ...	11,511	8,723	54	371	471·37	757·8	4·69	32·23	40·95	14·95	19·72		

	ROYAL ARTILLERY.															
Depôt.	Royal Horse Artillery	431	290	9	32	11·04	672·9	20·88	74·25	25·61	9·35	13·90	Woolwich, 12 months	Permanent.
A	Royal Horse Artillery	16	9	—	—	·16	562·5	—	—	10·00	3·65	6·49	Dorchester, 1 month. From South Africa	—
M	Royal Horse Artillery	30	18	—	—	1·14	600·0	—	—	38·00	13·87	23·12	Newbridge, 2 months. To South Africa	—
N	Royal Horse Artillery	172	134	—	12	9·36	779·1	—	69·77	54·42	19·86	25·50	Aldershot, 12 months	2
S	Royal Horse Artillery	176	196	2	11	9·00	1113·6	11·36	62·50	51·14	18·66	16·76	Aldershot, 12 months	1
V	Royal Horse Artillery	96	103	—	—	3·14	1072·9	—	—	32·71	11·94	11·13	London, 7 months	—
W	Royal Horse Artillery	32	33	—	—	·12	1031·3	—	—	3·75	1·37	1·33	Woolwich, 11 months. Newly formed ...	—
X	Royal Horse Artillery	26	19	—	—	·07	730·8	—	—	2·69	·98	1·34	Woolwich, 11 months. Newly formed ...	—
Y	Royal Horse Artillery	125	164	1	14	6·79	1312·0	8·00	112·00	54·32	19·83	15·11	Aldershot, 11 months. Newly formed ...	—
Z	Royal Horse Artillery	110	65	3	2	3·38	590·9	27·27	18·18	30·73	11·22	18·98	Curragh, 11 months. Newly formed ...	—
AA	Royal Horse Artillery	114	34	—	1	1·80	298·2	—	8·77	15·79	5·76	19·33	Curragh, 11 months. Newly formed ...	—
BB	Royal Horse Artillery	104	51	—	1	1·85	490·4	—	9·62	17·79	6·49	13·24	Christchurch, 8½ months. Newly formed	—
—	Riding Establishment	105	49	—	1	1·51	466·7	—	9·52	14·38	5·25	11·25	Woolwich, 12 months	Permanent.
Depôt.	Royal Field Artillery	1,425	1,150	25	64	96·92	807·0	17·54	44·91	68·02	24·82	30·76	Woolwich, 12 months	—
2nd	Royal Field Artillery	349	119	—	1	6·44	341·0	—	2·87	18·45	6·74	19·75	Maryhill, 10 months...	—
3rd	Royal Field Artillery	266	97	—	4	3·93	364·7	—	15·04	14·77	5·39	14·79	Ipswich, 7 months. From Woolwich ...	—
4th	Royal Field Artillery	200	113	1	2	4·97	565·0	5·00	10·00	24·85	9·07	16·05	Bristol, 9 months	—
5th	Royal Field Artillery	182	206	—	5	9·81	1131·9	—	27·47	53·90	19·67	17·38	Dublin, 10 months	—
6th	Royal Field Artillery	140	90	—	5	3·00	642·9	—	35·71	21·43	7·82	12·17	Seaforth, 12 months...	—
5th	Royal Field Artillery	13	29	1	—	·46	2230·8	76·92	—	35·38	12·91	5·79	Athlone, 1 month. To South Africa ...	—
8th	Royal Field Artillery	13	8	1	—	·53	615·4	76·92	—	40·77	14·88	24·18	Hilsea, 1 month. To South Africa ...	—
9th	Royal Field Artillery	13	24	—	—	·79	1846·2	—	—	60·76	22·18	12·01	Athlone, 1 month. To South Africa ...	—

Battery or Battalion.	Corps.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years at Home since last return from Service Abroad.
							Admitted.	Died.	Invalided.	Average Constantly Sick.				
	ROYAL ARTILLERY—*cont.*										days.	days.		
10th	Royal Field Artillery	159	150	3	2	7·52	943·4	18·87	12·58	47·29	17·26	18·30	Aldershot, 11 months; Okehampton, 1 month.	2
17th	Royal Field Artillery	21	10	1	—	·02	476·2	47·62	—	·95	·35	·73	Woolwich. To South Africa	—
26th	Royal Field Artillery	138	164	—	13	7·87	1188·4	—	94·20	57·03	20·81	17·51	Aldershot, 11 months. Okehampton, 1 month.	2
39th	Royal Field Artillery	13	10	—	—	·50	769·2	—	—	38·46	14·04	18·25	Hilsea, 1 month. To South Africa ...	—
44th	Royal Field Artillery	19	18	—	—	1·10	947·4	—	—	57·89	21·13	22·31	Colchester, 1 month. To South Africa...	—
59th	Royal Field Artillery	155	60	—	4	3·06	387·1	—	25·81	19·74	7·21	18·62	Cahir, 11 months; Woolwich, 1 month...	2
68th	Royal Field Artillery	10	7	—	—	·23	700·0	—	—	23·00	8·40	12·00	Hilsea, 1 month. To South Africa ...	—
88th	Royal Field Artillery	13	11	—	1	·28	846·1	—	76·92	21·54	7·86	9·29	Weedon, 1 month. To South Africa ...	—
89th	Royal Field Artillery	176	199	2	9	9·90	1130·7	11·36	51·14	56·25	20·53	18·16	Clonmel, 1 month; Aldershot, 11 months	2
90th	Royal Field Artillery	178	175	1	8	10·56	983·1	5·62	44·94	59·33	21·65	22·03	Aldershot, 12 months	2
91st	Royal Field Artillery	155	185	2	11	10·25	1193·5	12·90	70·97	66·13	24·14	20·22	Aldershot, 11 months; Okehampton, 1 month.	2
92nd	Royal Field Artillery	118	144	1	6	6·38	1220·3	8·47	50·85	54·07	19·73	16·17	Colchester, 1 month; Aldershot, 11 months.	2
93rd	Royal Field Artillery	110	70	—	1	2·91	630·6	—	9·01	26·45	9·66	15·31	Cahir, 12 months	2
94th	Royal Field Artillery	159	106	—	2	4·64	666·7	—	12·58	29·18	10·63	15·98	Leeds, 1 month; Clonmel, 11 months ...	1
95th	Royal Field Artillery	173	133	—	2	7·52	768·8	—	11·56	43·47	15·87	20·64	Leeds, 12 months	1
96th	Royal Field Artillery	119	48	5	4	3·06	403·4	42·02	33·61	25·71	9·39	23·27	Birmingham, 8½ months; Preston, 1 month; York and Strensall, 2½ months.	1
97th	Royal Field Artillery	165	92	—	1	4·41	557·5	—	6·06	20·73	9·76	17·50	Leeds and Strensall, 7 months; Ipswich, 5 months.	1

98th	Royal Field Artillery	136	113	1	6	4·19	830·9	7·35	44·12	30·81	11·25	13·53	Ipswich, 5 months; Athlone, 7 months ..	1
99th	Royal Field Artillery	129	89		2	2·97	689·9	—	15·50	23·02	8·40	12·18	Longford, 11½ months. Formed 17th January.	—
100th	Royal Field Artillery	130	115		10	4·47	884·6	7·69	76·92	34·38	12·55	14·19	Athlone, 11 months. Formed 3rd February.	—
101st	Royal Field Artillery	134	134		4	7·41	1000·0	7·46	29·85	55·30	20·18	20·18	Hilsea, 11 months. Formed 24th January.	—
102nd	Royal Field Artillery	144	143	2	4	6·55	993·0	6·94	27·97	45·49	16·60	16·72	Hilsea, 11 months. Formed 23rd January.	—
103rd	Royal Field Artillery	151	164	3	2	7·96	1086·1	19·87	13·25	52·72	19·24	17·72	Hilsea. 11½ months. Formed 13th January.	—
104th	Royal Field Artillery	121	92	3	3	5·71	760·3	24·79	24·79	47·19	17·22	22·65	Shorncliffe, 11 months. Formed 1st February.	—
105th	Royal Field Artillery	136	102	—	3	4·59	750·0	—	22·06	33·75	12·32	16·42	Shorncliffe, 11 months. Formed 1st February.	—
106th	Royal Field Artillery	130	85	—	3	4·70	653·8	—	23·08	36·15	13·20	20·18	Shorncliffe, 11 months. Formed 1st February.	—
107th	Royal Field Artillery	37	34	—	—	·06	918·9	—	—	1·62	·59	·64	Woolwich, 11 months. Formed 1st February.	—
108th	Royal Field Artillery	36	30	—	—	·06	833·3	—	—	1·67	·61	·73	Woolwich, 11 months. Formed 1st February.	—
109th	Royal Field Artillery	29	28	1	—	·05	965·5	34·48	—	1·72	·63	·65	Woolwich, 11 months. Formed 1st February.	—
110th	Royal Field Artillery	114	83	—	—	4·90	728·0	—	—	42·98	15·69	21·55	Newcastle-on-Tyne, 10 months. Formed 3rd March.	—
111th	Royal Field Artillery	105	85	—	—	6·42	809·6	—	—	61·15	22·32	27·57	Newcastle-on-Tyne, 10 months. Formed 3rd March.	—
112th	Royal Field Artillery	101	65	2	1	3·99	643·6	19·80	9·90	39·51	14·42	22·41	Newcastle-on-Tyne, 10 months. Formed 3rd March.	—
113th	Royal Field Artillery	122	46	—	—	1·59	377·1	—	—	13·03	4·76	12·62	Colchester, 10½ months. Formed 15th February.	—
114th	Royal Field Artillery	112	60	2	5	3·20	535·7	17·86	44·64	28·57	10·43	19·47	Colchester, 10½ months. Formed 15th February.	—
115th	Royal Field Artillery	86	76	1	1	2·39	883·8	11·63	11·63	27·79	10·14	11·48	Weedon, 9½ months. Formed 15th March.	—
116th	Royal Field Artillery	73	43	—	—	2·07	589·1	—	—	28·36	10·35	17·57	Ipswich, 7 months. Formed May ...	—
117th	Royal Field Artillery	68	40	1	2	1·68	588·2	14·71	29·41	24·70	9·02	15·33	Ipswich, 7 months. Formed May ...	—
118th	Royal Field Artillery	124	140	1	3	5·00	1129·0	8·06	24·19	40·32	14·72	18·04	Coventry, 10½ months. Formed 15th February.	—
119th	Royal Field Artillery	124	110	1	6	5·10	887·1	8·06	48·39	41·13	15·01	16·92	Exeter, 10½ months. Formed 19th February.	—
120th	Royal Field Artillery	115	94	1	—	3·25	817·4	8·70	—	28·26	10·31	12·62	Exeter, 10½ months. Formed 19th February.	—
121st	Royal Field Artillery	100	115	—	2	4·02	1150·0	—	20·00	40·20	14·67	12·76	Dorchester, 9 months; Exeter, 1½ months. Formed 19th February.	—

Battery or Battalion.	Corps.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years at Home since last return from Service Abroad.
							Admitted.	Died.	Invalided.	Average Constantly Sick.				
	ROYAL ARTILLERY—*cont.*										days.	days.		
122nd	Royal Field Artillery	31	31	—	—	·07	1000·0	—	—	2·26	·82	·82	Woolwich, 7 months. Formed June ...	—
123rd	Royal Field Artillery	32	37	—	—	·11	1156·3	—	—	3·44	1·25	1·09	Woolwich, 7 months. Formed June ...	—
124th	Royal Field Artillery	27	58	—	—	·24	2148·1	—	—	8·89	3·24	1·51	Woolwich, 7 months. Formed June ...	—
125th	Royal Field Artillery	86	69	—	4	2·58	802·4	—	46·51	30·00	10·95	13·65	Fermoy, 9 months. Formed March ...	—
126th	Royal Field Artillery	80	89		—	3·59	1112·5	—	—	44·88	16·38	14·72	Limerick, 9 months. Formed March ...	—
127th	Royal Field Artillery	51	78	—	—	3·22	1529·4	—	—	63·14	23·05	15·07	Fermoy, 6 months. Formed June ...	—
128th	Royal Field Artillery	102	36	—	1	1·21	352·9	—	9·80	11·86	4·33	12·27	Brighton, 9 months. Formed April ...	—
129th	Royal Field Artillery	95	66	1	3	2·07	694·7	10·53	31·58	21·79	7·95	11·45	Brighton, 9 months. Formed April ...	—
130th	Royal Field Artillery	108	72	1	2	2·15	666·7	9·26	18·52	19·91	7·27	10·90	Brighton, 9 months. Formed April ...	—
131st	Royal Field Artillery	186	174	1	7	8·58	935·4	5·38	37·63	46·13	16·54	18·00	Chatham, 9 months. Formed April ...	—
132nd	Royal Field Artillery	92	75	—	1	2·97	815·2	—	10·87	32·28	11·78	14·45	Trowbridge, 8 months. Formed April ...	—
133rd	Royal Field Artillery	72	67	—	—	2·40	930·6	—	—	33·33	12·17	13·07	Newport, 8 months. Formed April ...	—
134th	Royal Field Artillery	86	97	—	2	4·96	1127·9	—	23·26	57·67	21·05	18·66	Sheffield, 7 months. Formed May ...	—
135th	Royal Field Artillery	78	112	—	3	4·60	1435·9	—	38·46	58·97	21·52	14·99	Sheffield, 7 months. Formed May ...	—
136th	Royal Field Artillery	34	39	—	—	·17	1147·1	—	—	5·00	1·83	1·59	Woolwich, 7 months. Formed May ...	—
140th	Royal Field Artillery	43	60	—	3	2·67	1395·3	—	69·77	62·09	22·66	16·24	Curragh, 5 months; Belturbet, 1½ months. Formed June.	—
141st	Royal Field Artillery	47	76	—	2	3·91	1617·0	—	42·55	83·19	30·36	18·78	Curragh, 5 months; Kilkenny, 1½ months. Formed June.	—

142nd	Royal Field Artillery	28	78	—	5	4·36	2785·7	—	178·57	155·72	156·84	20·40	Curragh, 6 months. Formed June ...	—
143rd	Royal Field Artillery	41	41	—	1	1·06	1000·0	—	24·39	25·85	9·44	9·44	Fethard, 6½ months. Formed June ...	—
144th	Royal Field Artillery	29	25	—	—	·76	862·1	—	—	26·21	9·56	11·00	Clogheen, 6 months. Formed June ...	—
145th	Royal Field Artillery	84	69	1	—	2·04	821·4	11·90	—	35·00	12·78	15·55	Waterford, 9 months. Formed March ...	—
146th	Royal Field Artillery	48	139	—	4	5·78	2895·8	—	83·33	120·41	43·95	15·18	Aldershot, 5 months. Formed July ...	—
Depôt.	Royal Garrison Artillery, Mountain ...	171	123	2	2	5·02	719·3	11·70	11·70	29·36	10·72	14·90	Newport, 12 months	Permanent.
Eastn. Div.	Royal Garrison Artillery	2,897	1,153	25	24	51·78	398·0	8·63	8·25	17·87	6·52	16·39	Various	—
Sthn. Div.	Royal Garrison Artillery	2,727	1,578	29	88	93·41	578·7	10·63	32·27	34·25	12·50	21·60	Various	—
Wstn. Div.	Royal Garrison Artillery	1,585	1,030	7	54	67·19	649·8	4·42	34·07	42·39	15·47	23·81	Various	—
	Sierra Leone Detachment	74	25	—	—	·79	337·8	—	—	10·68	3·90	11·54	Sandown, 12 months	1
	Regimental District Staff	1,169	198	13	2	5·02	169·4	11·12	1·71	4·29	1·57	9·25	Woolwich	—
	School of Gunnery	398	129	1	5	6·98	324·1	2·51	12·56	17·54	6·40	19·75	Shoeburyness	—
	Various	1,227	944	9	107	45·82	769·4	7·33	87·20	37·34	13·63	17·72	Various	—
	Total Royal Artillery	20,304	13,437	169	596	685·16	661·8	8·32	29·35	33·74	12·32	18·61		
	ROYAL ENGINEERS.													
	Royal Engineers	4,139	1,922	39	85	101·92	464·4	9·42	20·54	24·62	8·99	19·36	Various	—
	FOOT GUARDS.													
1st	Grenadier Guards...	1,573	1,000	10	43	51·61	635·7	6·36	27·34	32·81	11·97	18·84	Windsor, 3 months. London, 9 months	1
2nd	Grenadier Guards...	233	147	1	12	9·31	630·9	4·29	51·50	39·96	14·59	23·12	London, 3 months. To South Africa ...	—
3rd	Grenadier Guards...	33	51	—	—	1·97	1545·5	—	—	59·70	21·79	14·10	Caterham, 12 months	—
1st	Coldstream Guards	27	—	—	—	—	—	—	—	—	—	—	Caterham, 12 months	—
2nd	Coldstream Guards	44	—	—	—	—	—	—	—	—	—	—	Caterham, 12 months	—

Battery or Battalion.	Corps.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of Strength. Admitted.	Died.	Invalided.	Average Constantly Sick.	Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years at Home since last return from Service Abroad.
	FOOT GUARDS—*cont.*										days.	days.		
3rd	Coldstream Guards	1,086	1,349	7	129	81·21	1,242·2	6·44	118·78	74·78	27·29	21·97	London, 12 months	2
1st	Scots Guards	61	—	1	—	—	—	16·39	—	—	—	—	Caterham, 12 months	—
2nd	Scots Guards	234	223	1	8	12·04	953·0	4·27	34·19	51·45	18·78	19·71	London, 3 months. To South Africa ...	—
3r	Scots Guards	647	818	6	89	53·50	1,264·3	9·27	137·56	82·69	30·18	23·87	London, 12 months	1
1st	Irish Guards	106	98	—	—	2·99	924·5	—	—	28·21	10·30	11·14	London, 12 months	1
	Detachments	438	153	—	8	20·52	349·3	—	18·26	46·85	17·10	4·90	Various	—
	Royal Guards Reserve Regiment ...	400	176	4	14	10·57	440·0	10·00	35·00	26·43	9·65	2·19	London, 8 months	—
	Total Foot Guards	4,982	4,015	30	303	243·72	822·4	6·15	62·06	49·92	18·22	22·16		
	INFANTRY.													
1st	Royal Scots...	223	263	—	17	17·01	1179·4	—	76·23	76·29	27·83	23·60	Belfast and Holywood, 12 months ..	—
2nd	Royal West Surrey Regiment	261	152	1	12	10·29	582·4	3·83	45·98	39·43	14·39	24·71	Gosport, 6 months. To South Africa ...	—
2nd	East Kent Regiment	126	26	—	1	2·74	191·2	—	7·35	20·15	7·35	38·46	Chichester and Cork	—
1st	Royal Lancaster Regiment	784	690	6	58	35·28	923·1	7·96	76·92	44·14	16·11	17·45	Aldershot, 9 months	—
3rd	Northumberland Fusiliers	356	190	1	7	13·61	533·7	2·81	19·66	38·24	13·95	26·15	York and Bradford, 8 months. Formed March.	—
4th	Northumberland Fusiliers	287	298	2	14	11·48	1038·3	6·97	48·78	40·00	14·60	14·06	York and Bradford, 8 months. Formed March.	—
2nd	Royal Warwickshire Regiment ...	72	102	—	16	5·55	1416·6	—	222·22	77·08	28·18	19·86	Colchester, 10 months	—

4th	Royal Warwickshire Regiment ...	520	284	2	6	12·58	546·2	3·85	11·54	24·19	8·53	16·17	Colchester, 10 months. Formed February.	—
4th	Royal Fusiliers	688	382	3	26	19·12	855·3	4·36	37·79	27·79	10·14	18·27	Dover, 10 months. Formed February ...	—
2nd	(King's) Liverpool Regiment ...	522	739	5	20	47·71	1454·0	9·58	38·31	91·40	33·36	22·94	Dublin, 10½ months; Curragh, 1½ months	8
3rd	(King's) Liverpool Regiment ...	154	153		5	7·18	993·5	—	82·47	46·63	17·02	17·13	Dublin, 10 months. Formed February...	—
4th	(King's) Liverpool Regiment ...	151	217		4	10·25	1437·0	—	26·49	67·58	24·77	17·24	Dublin, 9 months; Fermoy, 1 month. Formed February.	—
2nd	Norfolk Regiment...	183	124		2	5·09	677·6	5·46	10·93	27·38	10·15	14·98	Fermoy and Shorncliffe. To South Africa.	—
2nd	Lincolnshire Regiment	319	261	6	7	11·03	818·2	18·81	21·94	34·57	12·62	15·42	Preston, Parkhurst and Aldershot, 12 months.	—
2nd	Devonshire Regiment	209	128	4	2	7·77	612·4	19·14	9·57	37·80	13·57	22·16	Channel Islands, 12 months	—
1st	Suffolk Regiment	478	229		14	9·44	479·1	6·28	29·29	19·75	7·21	15·05	Dover, Shorncliffe, and Channel Islands, 12 months.	—
2nd	Somersetshire Light Infantry ...	193	19			6·31	616·6	—	—	32·69	11·93	19·35	Portland and Parkhurst, 12 months ...	—
2nd	West Yorkshire Regiment	227	121	2	9	7·73	533·0	8·81	39·65	34·05	12·43	23·32	Strensall and Aldershot, 12 months ...	—
2nd	East Yorkshire Regiment	413	298	2	31	13·55	721·6	4·84	75·06	32·81	11·98	16·60	Strensall, Lichfield, and Aldershot, 3 months. To South Africa.	—
2nd	Bedfordshire Regiment	165	141	3	6	8·54	854·5	18·18	86·36	51·75	18·89	22·11	Colchester, 6 months; Dublin, 1 month...	—
2nd	Leicestershire Regiment... ...	151	46		6	3·09	304·7	6·62	39·74	20·46	7·47	24·52	Curragh, 1 month. To Egypt	—
1st	Royal Irish Regiment	157	382	3	57	23·18	2433·1	19·11	363·06	147·64	53·89	22·15	Aldershot	—
1st	P.W.O. Yorkshire Regiment ...	162	120	1	14	7·33	789·5	6·58	92·11	48·22	17·60	22·29	Sheffield and Strensall	—
4th	Lancashire Fusiliers	563	558	5	23	35·45	991·1	8·88	40·85	62·97	22·99	23·19	Chatham, 6 months; Burnley, 2 months. Formed March.	—
2nd	Royal Scots Fusiliers	236	219		6	12·87	740·0	—	20·27	43·48	15·87	21·45	Aldershot	—
2nd	Cheshire Regiment	253	140	3	13	6·31	553·4	11·86	51·30	24·94	9·10	18·45	Limerick and Aldershot. To South Africa.	—
1st	Royal Welsh Fusiliers	30	35		13	5·03	897·4	25·64	333·33	128·97	47·08	52·46	Devonport	—
2nd	South Wales Borderers	297	207	2	44	7·61	697·0	6·73	146·15	25·62	9·35	13·42	Dublin and Aldershot. To South Africa	—
1st	King's Own Scottish Borderers...	165	168		19	11·42	1063·9	—	122·68	73·68	26·89	24·81	Belfast and Holywood	—
2nd	Scottish Rifles	263	164	3	3	7·23	623·6	11·41	11·41	27·49	10·03	18·09	Maryhill and Chatham	—
1st	Royal Inniskilling Fusiliers ...	413	334	3	57	22·95	929·8	7·26	210·65	55·57	20·28	21·81	Mullingar and Aldershot	—

Battery or Battalion.	Corps.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided	Average Constantly Sick.	Ratio per 1,000 of Strength. Admitted.	Died.	Invalided.	Average Constantly Sick.	Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years at Home since last return from Service Abroad.
	INFANTRY—*cont.*										days.	days.		
2nd	Gloucestershire Regiment	167	117	4	20	5·76	700·6	23·95	119·76	34·49	12·59	17·97	Athlone and Aldershot	—
1st	Worcestershire Regiment	256	216	10	10	14·28	843·7	39·06	39·06	55·78	20·36	24·13	Devonport and Aldershot. To South Africa.	—
3rd	Worcestershire Regiment	306	287	3	24	15·61	937·9	9·80	78·43	51·01	18·62	19·85	Aldershot. Formed February	—
4th	Worcestershire Regiment	355	326	1	29	16·81	918·3	2·82	81·69	47·35	17·28	18·82	Aldershot. Formed February	—
1st	East Lancashire Regiment	481	325	—	22	18·64	675·6	—	45·74	38·75	14·14	20·93	Curragh, Dublin and Aldershot. To South Africa.	—
2nd	East Surrey Regiment	356	262	5	14	13·98	736·0	14·04	39·33	39·27	14·30	19·47	Holywood, Londonderry and Aldershot...	—
2nd	Duke of Cornwall's Light Infantry ...	175	77	—	54	3·09	440·0	—	308·57	17·66	6·44	14·64	Devonport	—
1st	West Riding Regiment	133	176	2	20	9·27	1323·3	15·04	150·38	69·70	25·44	19·22	Cork and Dublin	—
1st	Border Regiment	175	109	—	7	5·50	622·8	—	40·00	31·43	11·47	18·42	Fermoy and Colchester	—
2nd	Hampshire Regiment	395	301	1	21	15·55	762·0	2·53	53·16	39·37	14·37	18·86	Cork and Aldershot. To South Africa ...	—
1st	South Staffordshire Regiment	218	222	3	3	13·00	1018·3	13·76	13·76	59·63	21·76	21·37	Lichfield and Aldershot. To South Africa.	—
2nd	South Staffordshire Regiment	24	3	—	9	·10	125·0	—	375·00	4·17	1·52	12·17	Lichfield	—
2nd	Dorsetshire Regiment	268	136	3	6	8·19	507·5	11·19	22·39	30·56	11·15	21·98	Queenstown	—
1st	South Lancashire Regiment	253	167	1	21	11·98	660·1	3·95	83·05	47·35	17·28	26·18	Bradford, Preston and Aldershot... ...	—
1st	Welsh Regiment	209	140	2	3	4·28	669·9	9·57	14·35	20·48	7·47	11·16	Pembroke Dock	—
2nd	Royal Highlanders	110	39	–	—	5·98	354·5	–	—	54·37	19·84	55·97	Montrose	—

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Battery or Battalion.	Corps.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years at Home since last return from Service Abroad.
							Admitted.	Died.	Invalided.	Average Constantly Sick.				
	INFANTRY—*cont.*													
	Argyll and Sutherland Highlanders	281	242	—	14	12·32	861·2	—	49·82	48·35	16·00	18·58	Dublin and Finner Camp	—
1st	Leinster Regiment	89	121	2	10	8·61	1359·5	22·47	112·36	96·74	35·31	25·97	Aldershot	—
	Royal Dublin Fusiliers	248	224	2	40	14·52	943·6	8·06	161·29	58·55	21·37	22·64	Portsmouth and Curragh. To South Africa.	—
1st	Rifle Brigade	251	120	3	14	6·42	478·1	11·95	55·78	25·58	9·34	19·53	Curragh and Netley...	—
4th	Rifle Brigade	901	968	2	8	47·13	1074·3	2·22	8·88	52·31	19·09	17·77	Dublin, 12 months	10
1st	Royal Home Counties Reserve Regiment.	678	252	16	11	9·55	371·7	11·66	16·22	14·09	5·14	13·83	Aldershot, 10½ months	—
2nd	Royal Home Counties Reserve Regiment.	694	188		9	8·92	270·9		12·97	12·85	4·69	17·32	Aldershot, 8 months...	—
1st	Royal Northern Reserve Regiment	669	177	25	1	8·13	264·6	9·77	1·49	12·15	4·44	16·76	Aldershot	—
2nd	Royal Northern Reserve Regiment	590	344		22	15·90	583·0		37·29	26·95	9·83	16·87	Devonport	—
3rd	Royal Northern Reserve Regiment	621	295		12	15·27	475·0		19·32	24·59	8·97	18·89	Aldershot	—
4th	Royal Northern Reserve Regiment	678	258		58	11·73	380·5		85·55	17·30	6·31	16·60	Aldershot	—
1st	Royal Rifle Reserve Regiment ...	729	281	10	18	18·05	385·5	12·35	24·69	24·76	9·04	23·45	Portsmouth, 8 months	—
2nd	Royal Rifle Reserve Regiment ...	81	73		—	3·32	901·2		—	40·99	14·96	16·60	Portsmouth, 8 months	—
1st	Royal Southern Reserve Regiment	1,087	389	20	16	21·48	357·8	15·56	14·72	19·77	7·21	20·16	Portsmouth, 8 months	—
2nd	Royal Southern Reserve Regiment	198	67		7	3·18	338·4		35·35	16·06	5·86	17·32	Portsmouth, 8 months	—

1st	Royal Lancashire Reserve Regiment	606	248	10	8	11·54	409·2	31·35	13·20	19·04	6·95	16·99	Burnley	—
1st	Royal Scottish Reserve Regiment ...	559	80	8	2	6·10	143·1	7·39	3·58	10·91	3·98	27·83	Fort George, 9½ months	—
2nd	Royal Scottish Reserve Regiment ...	524	239		19	11·83	456·1		36·26	22·57	8·24	18·07	Glencorse	—
	Royal Eastern Reserve Regiment ...	856	474	4	35	23·34	553·7	4·67	40·89	27·26	9·95	17·97	Warley and Aldershot	—
	Royal Irish Reserve Regiment ...	428	181	3	7	7·15	422·9	7·01	16·35	16·71	6·10	14·42	Curragh and Athlone	—
	Royal Irish Fusiliers Reserve Regiment.	599	384	5	31	16·28	641·0	8·35	51·75	27·18	9·92	15·48	Holywood and Belfast	—
	Other Infantry...	1,658	1,809	22	268	145·44	1091·1	13·27	161·64	87·72	32·02	29·34	Various	—
		33,182	22,997	282	1,756	1285·80	693·1	8·50	52·92	38·75	14·15	20·42		
	REGIMENTAL DEPÔTS.													
Depôt.	Royal Scots	187	94	—	—	4·63	502·7	—	—	24·76	9·04	17·98	Glencorse	Since formation.
,,	Royal West Surrey Regiment ...	213	185	2	18	7·02	868·6	9·39	84·51	32·95	12·03	13·85	Guildford	,,
,,	East Kent Regiment	256	212	3	11	8·18	828·2	11·72	42·97	31·95	11·66	14·06	Canterbury	,,
,,	Royal Lancaster Regiment	55	31	—	2	1·84	563·6	—	36·36	33·45	12·21	21·67	Lancaster	,,
,,	Northumberland Fusiliers	181	140	1	2	10·03	773·4	5·52	11·05	55·42	20·23	26·15	Newcastle	,,
,,	Royal Warwickshire Regiment ...	248	50	—	3	2·82	201·6	—	12·10	11·37	4·15	20·58	Warwick	,,
,,	Royal Fusiliers...	202	108	3	7	8·57	534·7	14·85	34·65	42·43	15·49	28·96	Hounslow	,,
,,	Liverpool Regiment	143	89	1	5	2·97	622·4	6·99	34·97	20·77	7·58	12·18	Warrington	,,
,,	Norfolk Regiment	165	88	1	1	4·12	533·3	6·06	6·06	24·97	9·11	17·09	Norwich	,,
,,	Lincolnshire Regiment	120	67	3	2	3·86	558·3	25·00	16·67	32·17	11·74	21·03	Lincoln	,,
,,	Devonshire Regiment	199	129	—	2	5·38	648·2	—	19·05	27·04	9·87	15·23	Exeter	,,
,,	Suffolk Regiment	141	125	2	5	5·05	886·6	14·18	35·46	35·82	13·07	14·75	Bury St. Edmunds	,,
,,	Somersetshire Regiment	169	78	2	2	4·67	461·5	11·83	11·83	27·63	10·90	21·85	Taunton	,,

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							Admitted.	Died.	Invalided.	Average Constantly Sick.				
	REGIMENTAL DEPÔTS—*cont.*										days.	days.		
Depôt.	West Yorkshire Regiment	300	169	1	9	5·58	563·3	3·33	30·00	18·60	6·79	12·05	York	Since formation.
,,	East Yorkshire Regiment	202	104	—	4	4·36	514·9	—	19·80	21·58	7·88	15·30	Beverley	,,
,,	Bedfordshire Regiment	115	102	1	5	5·82	887·0	17·39	43·48	50·61	18·47	20·83	Bedford	,,
,,	Leicestershire Regiment	241	198	3	4	8·95	821·6	12·45	16·60	37·14	13·55	16·50	Leicester	,,
,,	Royal Irish Regiment	148	94	4	4	4·75	635·1	27·03	27·03	32·10	11·71	18·44	Clonmel	,,
,,	Yorkshire Regiment	132	45	4	4	3·10	340·9	30·30	30·30	23·49	8·57	25·15	Richmond	,,
,,	Lancashire Fusiliers	128	72	—	3	4·15	562·5	—	23·44	32·43	11·83	21·04	Bury	,,
,,	Royal Scots Fusiliers	139	166	2	4	6·66	1194·2	14·39	28·78	47·92	17·49	14·65	Ayr	,,
,,	Cheshire Regiment	169	100	1	5	3·75	591·7	5·92	29·59	22·19	8·10	13·69	Chester	,,
,,	Royal Welsh Fusiliers	264	274	4	10	9·60	1037·9	15·15	37·88	36·37	13·27	12·79	Wrexham	,,
,,	South Wales Borderers	130	104	5	—	5·55	800·0	38·46	—	42·69	15·58	19·48	Brecon	,,
,,	King's Own Scottish Borderers	161	159	4	2	6·51	987·6	24·84	12·42	40·43	14·76	14·04	Berwick	,,
,,	Scottish Rifles	202	113	5	5	4·06	559·3	24·75	24·75	20·10	7·34	13·10	Hamilton	,,
,,	Royal Inniskilling Fusiliers	173	69	2	7	2·76	398·8	11·56	40·46	15·95	5·82	14·60	Omagh	,,
,,	Gloucestershire Regiment	260	123	1	10	5·19	457·2	3·72	37·17	19·29	7·04	15·40	Horfield, Bristol	,,

,,	Worcestershire Regiment	159	94	—	3	2·59	591·2	—	18·87	16·29	5·95	10·06	Worcester	,,
,,	East Lancashire Regiment	*168	148	1	3	5·23	881·0	5·95	17·86	31·13	11·36	12·90	Preston	,,
,,	East Surrey Regiment	210	112	3	2	4·03	533·3	14·29	9·52	19·90	7·00	13·13	Kingston-on-Thames	,,
,,	Duke of Cornwall's Light Infantry ...	183	77	—	4	5·60	420·8	—	21·86	30·60	11·17	26·54	Bodmin	,,
,,	West Riding Regiment	148	176	—	3	6·30	1189·2	—	20·27	42·57	15·54	13·06	Halifax	,,
,,	Border Regiment	190	97	3	9	3·35	510·5	15·79	47·37	17·63	6·44	12·61	Carlisle	,,
,,	Royal Sussex Regiment	99	129	1	—	4·48	1303·0	10·10	—	45·25	16·52	12·68	Chichester	,,
,,	Hampshire Regiment	253	162	3	4	8·19	640·3	11·86	15·81	32·37	11·81	18·45	Winchester	,,
,,	South Staffordshire Regiment	209	169	5	—	5·40	808·6	23·92	—	25·84	9·43	11·66	Lichfield	,,
,,	Dorsetshire Regiment	144	117	3	7	4·39	943·5	24·19	56·45	35·40	12·92	13·69	Dorchester	,,
,,	South Lancashire Regiment	129	122	1	9	4·08	945·7	7·75	69·77	31·63	11·54	12·21	Warrington	,,
,,	Welsh Regiment	175	123	2	2	6·75	702·8	11·43	11·43	38·57	14·08	20·03	Cardiff	,,
,,	Royal Highlanders	293	178	—	3	5·70	607·5	—	10·24	19·45	7·10	11·69	Perth	,,
,,	Oxfordshire Light Infantry	175	170	1	6	8·13	970·6	5·71	34·29	46·46	16·96	17·46	Oxford	,,
,,	Essex Regiment	223	159	—	9	8·22	713·0	—	40·36	36·86	13·45	18·87	Warley...	,,
,,	Derbyshire Regiment	178	46	4	4	2·91	258·4	22·47	22·47	16·35	5·97	23·09	Derby	,,
,,	Loyal North Lancashire Regiment ...	161	122	2	4	7·71	757·8	12·42	24·84	47·89	17·48	23·07	Preston	,,
,,	Northamptonshire Regiment	191	134	2	7	4·14	701·6	10·47	36·65	21·68	7·91	11·28	Northampton	,,
,,	Royal Berkshire Regiment	215	190	—	20	13·08	883·7	—	93·02	60·34	22·21	25·13	Reading	,,
,,	Royal West Kent Regiment	223	229	4	2	10·06	1026·9	17·94	8·97	45·11	16·46	16·03	Maidstone	,,
,,	Yorkshire Light Infantry	224	231	3	6	13·46	1031·3	13·39	26·79	60·09	21·93	21·27	Pontefract	,,
,,	Shropshire Light Infantry	154	100	1	2	5·41	649·4	6·49	12·99	35·13	12·82	19·74	Shrewsbury	,,
,,	Middlesex Regiment	199	66	—	4	·85	331·7	—	20·10	24·37	8·90	26·82	Hounslow	,,
,,	Wiltshire Regiment	114	78	1	2	3·77	684·2	8·77	17·54	33·07	12·07	17·64	Devizes	,,

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							Admitted.	Died.	Invalided.	Average Constantly Sick.				
	REGIMENTAL DEPÔTS—*cont.*										days.	days.		
Depôt.	Manchester Regiment	154	122	3	4	4·82	792·2	19·48	25·97	31·30	11·42	14·42	Ashton-under-Lyne	Since formation.
,,	North Staffordshire Regiment	163	115	1	1	4·76	705·4	6·13	6·13	29·20	10·66	15·11	Lichfield	,,
,,	York and Lancaster Regiment	156	126	3	3	6·52	807·8	19·23	19·23	41·80	15·26	18·89	Pontefract	,,
,,	Durham Light Infantry	197	166	1	—	9·45	842·6	5·08	—	47·97	17·51	20·78	Newcastle	,,
,,	Highland Light Infantry	196	55	1	1	2·33	280·6	5·10	5·10	11·88	4·34	15·46	Hamilton	,,
,,	Seaforth Highlanders	438	128	1	2	8·34	292·2	2·28	4·57	19·04	6·95	23·78	Fort George	,,
,,	Gordon Highlanders	262	265	1	3	5·52	1011·5	3·82	11·45	21·07	7·69	7·60	Aberdeen	,,
,,	Cameron Highlanders	252	125	1	5	5·19	496·1	3·97	19·84	20·60	7·52	15·15	Inverness	,,
,,	Royal Irish Rifles	162	182	4	8	9·36	1123·5	24·69	49·38	57·78	21·09	18·77	Belfast	,,
,,	Royal Irish Fusiliers	154	113	2	6	5·18	733·8	12·99	38·96	33·64	12·28	16·73	Armagh	,,
,,	Connaught Rangers	166	106	1	4	5·47	638·6	6·02	24·10	32·95	12·03	18·84	Galway	,,
,,	Argyll and Sutherland Highlanders ...	236	175	3	5	6·21	741·5	12·71	21·19	26·31	9·60	12·95	Stirling	,,
,,	Leinster Regiment	268	314	1	10	9·59	1171·6	3·73	37·31	35·78	13·06	11·15	Birr	,,
,,	Royal Munster Fusiliers	296	152	2	6	7·03	513·5	6·76	20·27	23·75	8·67	16·88	Tralee	,,
,,	Royal Dublin Fusiliers	184	81	1	3	4·46	440·2	5·43	16·30	24·24	8·85	20·10	Naas	,,
,,	King's Royal Rifle Corps, and Rifle Brigade	794	464	7	37	28·00	584·4	8·82	46·60	36·02	13·15	22·50	Gosport	,,

Provisional Battalion	745	566	1	52	31·63	759·7	1·34	69·90	42·46	15·50	20·40	Shorncliffe	1
Details Regimental Depôts	9	—	—	—	—	—	—	—	—	—	—		
Total Regimental Depôts ...	14,281	9,772	129	401	452·22	684·3	9·03	28·08	31·66	11·56	16·89		
Garrison Staff and Departments ...	4,506	2,013	48	148	156·65	446·7	10·65	32·84	34·76	12·69	28·40	Various.	
EMBODIED MILITIA.													
Artillery Militia	6,409	3,504	33	114	129·71	546·7	5·15	17·79	20·24	7·39	13·51	Various.	
Engineer Militia	719	282	6	13	13·01	392·2	8·34	18·08	18·09	6·60	16·84	Various.	
Infantry Militia	31,753	19,658	224	1,270	985·09	619·1	7·05	39·99	31·02	11·32	18·29	Various.	
Militia Medical Staff Corps	31	29	—	—	2·35	935·5	—	—	75·81	27·67	29·58	Various.	
	38,912	23,473	263	1,397	1130·16	603·2	6·767	35·90	29·04	10·60	17·58		
Yeomanry	198	115	1	1	2·75	580·8	5·05	5·05	13·90	5·07	8·74	Various.	
Volunteers	180	61	6	2	2·38	338·9	33·33	11·11	13·22	4·83	14·24	Various.	

ABSTRACT No. XXIX.—Table, taken from the Reports of the Principal Medical Officers, showing general Health Statistics of the various Corps which served in the different Commands Abroad during the Year 1900.

Battery, Company, or Estm.	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength. Admitted.	Ratio per 1,000 of Strength. Died.	Ratio per 1,000 of Strength. Invalided.	Ratio per 1,000 of Strength. Constantly Sick.	Sick to each Soldier. Average Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Completed Years of Service in the Command.
	GIBRALTAR.												days.	days.		
	Royal Artillery.															
11th	Eastern Division	268	90	1	—	1	9	7·12	335·8	3·73	33·58	26·57	9·70	28·88	Gibraltar, 12 months	3
18th	Eastern Division	239	62	2	—	2	3	4·83	259·4	8·37	12·55	20·21	7·38	28·43	Gibraltar, 12 months	3
19th	Eastern Division	208	64	1	—	1	3	5·53	307·7	4·81	14·42	26·59	9·70	31·51	Gibraltar, 12 months	3
20th	Eastern Division	199	84	1	—	1	7	7·50	422·1	5·03	35·18	37·69	13·76	32·59	Gibraltar, 12 months	3
2nd	Southern Division	10	5	—	—	—	—	·38	500·0	—	—	38·00	13·87	27·74	Gibraltar, 1 month. To South Africa.	—
10th	Southern Division	233	140	3	—	3	2	8·94	600·8	12·88	8·58	38·37	14·00	23·31	Gibraltar, 12 months	1
26th	Southern Division	229	113	—	—	—	8	9·39	493·4	—	34·93	41·00	14·97	30·33	Gibraltar, 12 months	2
2nd	Southern Division	203	139	—	—	—	2	9·47	684·7	—	9·85	46·65	17·03	24·67	Gibraltar, 12 months	—
	Other Artillery	—	—	—	—	—	—	·28	—	—	—	—	—	—	—	—
	Total	1,589	697	8	—	8	34	53·44	438·6	5·03	21·40	33·63	12·27	27·98		
	Royal Engineers.	310	130	4	—	4	10	7·66	419·3	12·90	32·26	24·71	9·02	21·51	Various	Various
	Infantry Regiments.															
3rd	Royal Fusiliers	935	62	4	1	5	22	86·23	492·5	5·33	23·45	38·62	14·10	28·62	Gibraltar, 12 months.	1

1st	South Staffordshire Regiment ...	70	57	—	—	—	—	4·83	814·3	—	—	69·00	25·18	30·93	Gibraltar, 1 month. To England, 2nd February.	—
1st	Royal Berkshire Regiment ...	885	529	2	—	2	18	33·05	597·7	2·26	20·34	37·24	13·63	22·80	Gibraltar, 11 months. From England, 2nd February.	—
2nd	Cameron Highlanders	908	642	3	—	3	18	41·63	707·0	4·03	19·82	45·85	16·73	23·67	Gibraltar, 12 months.	
	Other Infantry	26	20	1	—	1	—	2·24	769·2	—	—	86·15	31·44	40·88	Various	—
	Total	2,827	1,710	10	1	11	58	117·98	604·9	3·89	20·52	41·73	15·23	25·18		
	Garrison Staff and Departments.															
	Army Service Corps	46	15	—	—	—	—	·43	326·1	—	—	9·35	3·41	10·46	Various	Various.
	Royal Army Medical Corps ...	32	13	1	—	1	—	·41	406·2	31·25	—	12·81	4·68	11·51	Various	Various.
	Army Ordnance Corps	40	4	—	—	—	—	·08	100·0	—	—	2·00	·73	7·30	Various	Various.
	Garrison Staff, &c.	14	4	—	—	—	—	·37	285·7	—	—	26·43	9·65	34·76	Various	Various.
	Total	132	36	1	—	1	—	1·29	272·7	7·58	—	9·77	3·57	13·08		
	Grand Total	4,858	2,873	23	1	24	102	180·37	529·6	4·94	21·00	37·13	13·55	25·59		
	MALTA.															
	Royal Artillery.															
5th	Eastern Division	17	—	—	—	—	—	·18	—	—	—	10·59	3·86	—	To South Africa, 16th January.	—
17th	Eastern Division	197	111	2	—	2	2	5·73	563·4	10·15	10·15	29·09	10·62	18·84	Pembroke, 5 months. Upper St. Elmo, 7 months.	4
1st	Southern Division...	208	108	—	—	—	1	5·08	519·2	—	4·81	24·42	8·91	17·17	Pembroke, 10 months. Tigné, 2 months.	2
4th	Southern Division...	200	187	—	—	—	4	9·68	935·0	—	20·00	48·40	17·67	18·89	From England, 24th January. Tigné, 11 months.	—
13th	Southern Division...	221	212	—	—	—	12	15·56	959·3	—	54·30	70·41	25·70	26·79	From England, 3rd January. Ricasoli, 12 months.	—
17th	Southern Division...	192	145	—	—	—	7	9·48	755·2	—	36·46	49·37	18·02	23·86	Upper St. Elmo, 5 months. Ricasoli, 7 months.	3
19th	Southern Division...	231	104	2	—	2	3	6·60	450·2	8·66	12·99	28·57	10·43	23·16	Ricasoli, 5 months. Upper St. Elmo, 7 months.	3
27th	Southern Division...	204	119	2	—	2	5	5·95	583·3	9·80	24·51	29·17	10·65	18·25	Upper St. Elmo, 5 months. Pembroke, 7 months.	2
31st	Southern Division...	241	128	—	—	—	5	8·32	531·1	—	20·75	34·52	12·60	23·72	Pembroke, 12 months	2

Battery, Company, or Battalion	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength. Admitted.	Ratio per 1,000 of Strength. Died.	Ratio per 1,000 of Strength. Invalided.	Ratio per 1,000 of Strength. Constantly Sick.	Sick Time to each Soldier. Average	Duration of each Case of Sickness. Average	Stations occupied during the Year.	Completed Years of Service in the Command.
	MALTA—*cont.*															
24th	Western Division...	227	84	3	—	3	2	5·91	370·0	13·22	8·81	26·03	9·50	25·68	Ricasoli, 12 months	2
	Staff	34	2	—	—	—	—	·11	58·8	—	—	3·23	1·18	20·07	Various	Various.
	Total	1,972	1,200	9	—	9	41	72·60	608·5	4·56	20·79	36·82	13·44	22·08		
	Royal Engineers.	261	121	2	—	2	5	5·25	463·6	7·66	19·16	20·11	7·34	15·84	St. Francis, 12 months; Detachment Various Stations.	Various.
	Infantry Regiments.															
3rd	Royal Warwickshire Regiment	834	859	5	—	5	21	45·60	1030·0	6·00	25·18	54·68	19·96	19·38	Floriana, 12 months	2
3rd	Royal Fusiliers	—	—	—	—	—	1	·03	—	—	—	—	—	—		
2nd	Leicestershire Regiment ...	—	—	—	—	—	—	·15	—	—	—	—	—	—		
1st	Lancashire Fusiliers	737	800	6	—	6	11	45·68	1085·5	8·14	14·92	61·98	22·62	20·84	Crete, 12 months; Detachment Gozo, 12 months.	1
3rd	Lancashire Fusiliers	717	912	10	—	10	46	55·40	1272·0	13·95	64·15	77·26	28·20	22·17	Lower St. Elmo 12 months	2
1st	Royal Sussex Regiment	116	54	1	—	1	3	4·12	465·5	8·62	25·86	35·52	12·96	27·85	Verdala, 6 weeks. To South Africa, 20th February, 1900.	—
2nd	Derbyshire Regiment	800	561	5	—	5	19	32·19	701·2	6·25	23·75	40·24	14·69	20·94	Imtarfa, 12 months; Detachments Valetta and Forrest.	1
2nd	Loyal North Lancashire Regiment	763	815	1	1		14	36·74	1068·1	2·62	18·35	48·15	17·58	16·45	Pembroke, 12 months; Detachments Valetta and Forrest.	1

	Other Infantry	2	—	—	—	—	3	·94	—	—	—	—	—	—	Various	—
	Total	3,969	4,001	28	1	29	118	220·85	1008·1	7·31	29·73	55·64	20·31	20·15		
	Infantry Militia Regiments.															
5th	Northumberland Fusiliers ...	458	524	3	—	3	12	26·48	1144·1	6·55	26·20	57·82	21·10	18·45	Polverista, 10½ months; Detachments various stations. From England, 9th February, 1900.	—
3rd	Loyal North Lancashire Regt. ...	886	1,070	4	—	4	17	41·75	1207·7	4·51	19·19	47·12	17·20	14·24	Manoel, 9½ months; Mellieha, 2 months; Detachments various stations, From England, 22nd January, 1900.	—
3rd	Royal West Kent Regiment ...	980	1,071	6	—	6	29	56·10	1092·9	6·12	29·59	57·24	20·89	19·12	Verdala, 11½ months; Detachments various stations. From England, 13th January, 1900.	—
	Total	2,324	2,665	13	—	13	58	124·33	1146·7	5·59	24·96	53·50	19·53	17·03		
	Garrison Staff and Departments.															
	Royal Army Medical Corps ...	98	38	—	—	—	6	2·88	387·7	—	61·22	29·39	10·73	27·66	Various	Various.
	Army Ordnance Corps	40	14	1	—	1	—	·77	350·0	25·00	—	19·25	7·02	20·07	Various	Various.
	Garrison Staff, &c.	68	13	—	—	—	1	·99	191·2	—	14·71	14·56	5·31	27·79	Various	Various.
	Total	206	65	1	—	1	7	4·64	315·5	4·85	33·98	22·52	8·22	26·05		
	Grand Total	8,732	8,052	53	1	54	229	427·67	922·1	6·18	26·22	48·98	17·88	19·39		
	CANADA.															
	Royal Artillery.															
3rd	Western Division	190	176	2	—	2	3	5·80	926·3	10·53	15·79	30·53	11·14	12·03	Halifax, N.S., 12 months	1
19th	Western Division	183	112	1	—	1	—	5·00	612·3	5·46	—	27·32	9·97	16·29	Victoria, B.C., 12 months	* 2

Battery, Company, or Battn.	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength. Admitted.	Died.	Invalided.	Constantly Sick.	Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Completed Years of Service in the Command.
	CANADA—*cont.*												days.	days.		
	Royal Artillery—cont.															
20th	Western Division	202	125	2	—	2	3	5·09	618·8	9·90	14·85	25·20	9·20	14·86	Halifax, N.S., 12 months	5
	District Establishment	40	1	—	1	1	—	·14	25·0	25·00	—	3·50	1·28	51·10	Halifax, N.S., 12 months	Various.
	Total	615	414	5	1	6	6	16·03	673·2	9·76	9·76	26·06	9·51	14·13		
	Royal Engineers.															
18th	Company	82	20	1	1	2	—	·62	243·9	24·39	—	7·56	2·76	11·32	Halifax, N.S., 12 months	13
40th	Company	63	18	—	—	—	1	·75	285·7	—	15·87	11·90	4·35	15·21	Halifax, N.S., 12 months	12
2/44	Company	36	20	—	—	—	—	1·26	555·6	—	—	35·00	12·77	23·00	Victoria, B.C., 7 months. From England, 25th May, 1900.	1
48th	Company	28	17	—	—	—	—	·82	607·1	—	—	29·29	10·69	17·61	Victoria, B.C., 7 months. From England, 25th May, 1900.	1
	Super. Staff, &c.	19	1	—	—	—	—	·13	52·6	—	—	6·84	2·50	47·45	Halifax, N.S., and Victoria, B.C., 12 months.	Various.
	Total	228	76	1	1	2	1	3·58	333·3	8·77	4·39	15·70	5·73	17·19		
	Infantry Regiments.															
1st	Leinster Regiment	204	187	—	—	—	7	10·41	916·7	—	34·31	51·03	18·63	20·32	Halifax, N.S., 3 months. To England for S. Africa, 27th March, 1900.	1
3rd	Royal Canadian Regiment ...	675	952	4	—	4	—	31·35	1410·4	5·93	—	46·44	16·95	12·02	Halifax, N.S., and Victoria, B.C., 11 months. Raised, 2nd April, 1900.	—
	Total	879	1,139	4	—	4	7	41·76	1295·8	4·55	7·96	47·51	17·34	13·38		
	Garrison Staff and Departments.	46	9	—	—	—	—	·45	195·7	—	—	9·78	3·57	18·25	Halifax, N.S., and Victoria, B.C., 12 months.	Various.
	Grand Total	1,768	1,638	10	2	12	14	61·82	926·5	6·79	7·92	34·96	12·76	13·78		

	BERMUDA.															
	Royal Artillery.															
81h	Southern Division	198	62	1	—	1	1	3·74	313·1	5·05	5·05	18·89	6·89	22·02	St. George's, 12 months. Detachment Ireland Island, 6 weeks.	3
21st	Western Division	129	83	—	—	—	1	2·73	643·4	—	7·75	21·16	7·72	12·00	Ireland Island, 12 months. Detachment St. George's.	2
	Other Artillery	2	—	—	—	—	—	—	—	—	—	—	—	—	St. George's	Various.
	Total	329	145	1	—	1	2	6·47	440·7	3·04	6·08	19·66	7·18	16·29		
	Royal Engineers.															
3rd	Company	37	13	—	—	—	—	·73	351·3	—	—	19·73	7·20	20·49	Boaz Island, 12 months	2
27th	Company	89	31	1	—	1	—	1·73	348·3	11·24	—	19·44	7·09	20·37	St. George's, 12 months	12
36th	Company	103	37	—	—	—	3	1·92	359·2	—	29·13	18·64	6·80	18·94	Prospect, 12 months	10
	Total	229	81	1	—	1	3	4·38	353·7	4·37	13·10	19·13	6·98	19·74		
	Infantry Regiments.	14	1	—	—	—	1	·42	71·4	—	71·4	30·00	10·95	153·30	Various	Various.
	Garrison Staff and Departments.															
	Army Service Corps	6	—	—	—	—	—	—	—	—	—	—	—	—	Prospect, 12 months	—
	Royal Army Medical Corps ...	13	2	—	—	—	—	·12	153·8	—	—	9·23	3·37	21·90	Various	—
	Army Ordnance Corps	35	4	1	—	1	—	·28	114·3	28·57	—	8·00	2·92	25·55	Various	—
	Garrison Staff, &c.	6	—	—	—	—	—	—	—	—	—	—	—	—	Various	—
	Total	60	6	1	—	1	—	·40	100·0	16·67	—	6·67	2·43	24·34		
	Grand Total	632	233	3	—	3	6	11·67	368·7	4·75	9·49	18·46	6·74	18·28		

Battery, Company, or Battn.	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength. Admitted.	Died.	Invalided.	Constantly Sick.	Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Completed Years of Service in the Command.
	West Indies.															
	Barbados, &c.												days.	days.		
	Royal Artillery.															
1st	Western Division	114	112	3	—	3	1	6·43	982·5	26·32	8·77	56·40	20·59	20·95	St. Lucia, 12 months	3
	Other Artillery	24	6	—	—	—	—	·20	250·0	—	—	8·33	3·04	12·17	Various	Various.
	Total	138	118	3	—	3	1	6·63	855·1	21·74	7·25	48·04	17·54	20·51		
	Royal Engineers.	25	10	—	—	—	—	·67	400·0	—	—	26·80	9·78	24·46	Barbados and St. Lucia, 12 months ...	Various.
	Infantry Regiments.															
2nd	Leinster Regiment	514	462	2	2	4	13	34·08	898·8	7·78	25·29	66·30	24·20	26·92	Barbados and St. Lucia, 12 months ...	2
	Other Infantry	5	—	—	—	—	—	—	—	—	—	—	—	—	Barbados and St. Lucia, 12 months ...	Various.
	Total	519	462	2	2	4	13	34·08	890·2	7·71	25·05	65·66	23·97	26·92		
	Garrison Staff and Departments.															
	Army Service Corps	5	1	—	—	—	—	·02	200·0	—	—	4·00	1·46	7·30	Barbados and St. Lucia	Various.
	Royal Army Medical Corps ...	16	2	—	—	—	—	·09	125·0	—	—	5·62	2·05	16·42		
	Army Ordnance Corps	5	—	—	—	—	—	—	—	—	—	—	—	—	St. Lucia	Various.
	Army Pay Corps	4	2	—	—	—	—	·17	500·0	—	—	42·50	15·51	31·02	Barbados and St. Lucia	Various.
	Garrison Staff, etc.	2	2	—	—	—	—	·07	1000·0	—	—	35·00	12·77	12·77		
	Total	32	7	—	—	—	—	·35	218·8	—	—	10·94	3·99	18·25		
	Grand Total	714	597	5	2	7	14	41·73	836·1	9·80	19·61	58·45	21·33	28·51		

	JAMAICA.															
	Royal Artillery.															
22nd	Southern Division...	175	137	—	1	1	6	10·47	782·9	5·71	34·29	59·83	21·84	27·89	Port Royal, Newcastle and Up Park Camp, 12 months.	3
	Other Artillery	5	1	—	—	—	—	·07	200·0	—	—	14·00	5·11	25·55	Port Royal, 12 months	Various.
	Total	180	138	—	1	1	6	10·54	766·7	5·26	33·33	58·56	21·37	27·88		
	Royal Engineers.	61	20	—	—	—	—	1·72	327·9	—	—	28·20	10·29	31·39	Port Royal, Newcastle and Up Park Camp, 12 months.	Various.
	Infantry Regiments.															
2nd	Leinster Regiment	281	177	3	—	3	6	12·63	629·9	10·68	21·35	44·95	16·41	26·04	Newcastle and Up Park Camp, 12 months.	2
	Other Infantry	16	4	—	—	—	—	·06	250·0	—	—	3·75	1·37	5·48	Up Park Camp, 12 months	Various.
	Total	297	181	3	—	3	6	12·69	609·5	10·10	20·20	42·72	15·60	25·59		
	Garrison Staff and Departments.	28	3	—	—	—	1	·06	107·1	—	35·71	2·14	·78	7·30	Various stations, 12 months	Various.
	Grand Total	566	342	3	1	4	13	25·01	694·2	7·07	22·97	44·19	16·13	26·69		
	WESTERN AFRICA.															
	Various Corps	78	161	—	—	—	19	6·92	2064·1	—	243·59	88·72	32·38	15·69	Sierra Leone, various periods	—
	MAURITIUS.															
	Royal Artillery.															
8th	Western Division	144	112	2	—	2	2	9·33	777·8	13·89	13·89	64·79	23·65	30·41	Mauritius, 12 months	2
26th	Western Division...	131	134	1	—	1	1	8·14	1022·9	7·63	7·63	62·14	22·68	22·17	Mauritius, 12 months	3
	Other Artillery	20	2	—	—	—	—	·39	100·0	—	—	19·50	7·12	71·18	Mauritius, 12 months	Various.
	Total	295	248	3	—	3	3	17·86	840·7	10·17	10·17	60·54	22·09	26·30		

Battery, Company, or Battn	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength. Admitted.	Died.	Invalided.	Constantly Sick.	Sick Time to each Soldier.	Duration of each Case of Sickness.	Stations occupied during the Year.	Completed Years of Service in the Command.
	MAURITIUS—*contd.*												days.	days.		
43rd	Royal Engineers	44	31	—	—	—	2	2·41	704·5	—	45·45	54·77	19·99	28·37	Phœnix Camp, 12 months	4
	Other Engineers	42	22	—	—	—	—	1·14	523·8	—	—	27·14	9·91	18·91	Port Louis, 12 months	Various.
	Total	86	53	—	—	—	2	3·55	616·3	—	23·26	41·28	15·07	24·45		
	Infantry Regiments.															
2nd	King's Own Yorkshire L.I. ...	56	42	—	—	—	3	3·89	750·0	—	53·57	69·46	25·35	33·81	Curepipe Camp, 12 months	1
	Garrison Staff and Departments.	26	6	—	—	—	1	·75	230·8	—	38·46	28·85	10·53	45·62	Various periods	Various.
	Grand Total	463	249	3	—	3	9	26·05	753·8	6·48	19·44	56·26	20·54	27·24		
	CEYLON.															
	Royal Artillery.															
34th	Southern Division	137	125	2	—	2	2	5·53	912·4	14·60	14·60	40·37	14·73	16·15	Trincomali, 12 months	2
37th	Southern Division	131	105	—	—	—	8	6·74	801·5	—	61·07	51·45	18·78	23·43	Colombo, 12 months	5
	Total	268	230	2	—	2	10	12·27	858·2	7·46	37·31	45·78	16·71	19·47		
	Royal Engineers.	87	53	—	—	—	6	2·63	609·2	—	68·97	30·23	11·03	18·11	Colombo, Kandy, Trincomali, and Dujatalawa.	Various.

	Infantry Regiments.															
1st	Gloucester Regiment	157	129	—	—	—	—	5·45	821·7	—	—	34·71	12·67	15·42	From South Africa, 5th September ...	—
1st	Duke of Cornwall's Light Infantry.	5	3	—	—	—	—	·31	600·0	—	—	62·00	22·63	37·71	From India, 29th December	—
2nd	King's Royal Rifle Corps ...	345	328	8	—	8	1	13·58	950·7	23·19	2·90	39 36	14·37	14·24	From South Africa, 9th August. To India, 31st December.	—
2nd	Highland Light Infantry ...	129	91	1	—	1	1	4·84	705·4	7·75	7·75	37·52	13·69	19·41	To England, 18th February	1
	Total	636	551	9	—	9	2	24·18	866·4	14·15	3·14	38·02	13·88	15·46		
	Garrison Staff and Departments.	39	10	—	—	—	2	·38	256·4	—	51·28	9·74	3·56	13·87	Colombo, Kandy, Trincomali, and Dujatalawa.	Various.
	Grand Total	1,030	844	11	—	11	20	39·46	819·4	10·68	19·42	38·31	13·98	16·67		
	CHINA.															
	Royal Artillery.															
25th	Eastern Division	144	238	1	1	2	10	14·43	1652·8	13·89	69·44	100·21	36·58	22·13	Hong Kong, 12 months	2
25th	Southern Division	139	198	1	1	2	4	10·55	1424·5	14·39	28·77	75·90	27·70	19·45	Hong Kong, 12 months	2
38th	Southern Division	139	156	3	—	3	5	9·24	1122·4	21·58	35·97	66·48	24·26	21·62	Hong Kong, 12 months	2
	Siege Train...	53	85	2	—	2	3	5·94	1603·8	37·74	56·60	112·08	40·91	25·51	Hong Kong, 2 months	—
	Total	475	677	7	2	9	22	40·16	1425·2	18·95	46·31	84·55	30·86	21·65		
	Royal Engineers.	179	113	5	—	5	3	5·85	631·2	27·93	16·76	32·68	11·93	18·90	Hong Kong, 12 months	Various.
	Infantry Regiments.															
2nd	Royal Welsh Fusiliers	755	1,146	10	1	11	41	75·68	1517·9	14·57	54·30	100·24	36·59	24·10	Hong Kong, 12 months	2
	Garrison Staff and Departments.	75	50	1	—	1	3	2·29	666·7	13·33	40·00	30·53	11·14	16·72	Hong Kong, 12 months	Various.
	Grand Total	1,484	1,986	23	3	26	69	123·98	1338·3	17·52	46·49	83·54	30·50	22·78		

Battery, Company, or Battn.	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength. Admitted.	Ratio per 1,000 of Strength. Died.	Ratio per 1,000 of Strength. Invalided.	Ratio per 1,000 of Strength. Constantly Sick.	Sick Average Time to each Soldier.	Duration of each Case of Sickness.	Stations occupied during the Year.	Completed Years of Service in the Command.
	STRAITS SETTLEMENTS.												days.	days.		
	Royal Artillery.															
12th	Southern Division	122	84	1	—	1	6	5·97	688·5	8·20	49·18	48·94	17·86	25·94	Blakan Mati, 6 months. Fort Canning, 6 months.	2
35th	Southern Division	127	91	3	—	3	7	7·83	716·5	23·62	55·12	61·65	22·50	31·41	Fort Canning, 3 months. Blakan Mati, 6 months. Fort Canning, 3 months.	2
	Other Artillery	—	—	—	—	—	4	·43	—	—	—	—	—	—		
	Total	249	175	4	—	4	17	14·23	702·8	16·06	68·27	57·15	20·86	29·68		
	Royal Engineers.	100	64	—	—	—	2	3·69	640·0	—	20·00	36·90	13·47	21·04	Blakan Mati and Pulo Brani, 12 months	Various.
	Infantry Regiments.															
1st	Royal Lancaster Regiment ...	148	95	—	—	—	3	6·15	641·9	—	20·27	41·56	15·17	23·62	Blakan Mati, Fort Canning and Tanglin, 2 months. To England.	—
	Garrison Staff and Departments.	30	4	—	—	—	1	·15	133·3	—	33·33	5·00	1·8	13·69	Various stations	Various.
	Grand Total	527	338	4	—	4	23	24·22	641·4	7·59	43·64	45·96	16·77	26·15		
	EGYPT AND CYPRUS.															
	Cavalry.															
11th	Hussars	470	316	2	—	2	9	18·63	672·3	4·26	19·15	39·64	14·47	21·52	Cairo, 12 months	1

	Royal Artillery.															
56th	Royal Field Artillery	160	139	2	—	2	1	9·36	868·8	12·50	6·25	58·50	21·35	24·58	Cairo, 12 months	3
16th	Eastern Division, ...	186	108	1	—	1	1	6·38	580·6	5·38	5·38	34·30	12·52	21·56	Cairo, 12 months. Detachment at Alexandria.	6
	Total	346	247	3	—	3	2	15·74	713·9	8·67	5·78	45·49	16·60	23·26		
	Royal Engineers.	95	28	—	—	—	1	1·61	294·7	—	10·53	16·95	6·19	20·99	Cairo, 12 months	5
	Infantry Regiments.															
2nd	Leicester Regiment	712	664	10	1	11	26	47·77	932·6	15·45	36·52	67·09	24·49	26·26	Alexandria, 10½ months. Detachment at Khartoum, 1 month. From England, 19th February.	—
3rd	Lancashire Regiment	72	58	—	—	—	—	2·12	805·6	—	—	29·44	10·75	13·34	Cyprus, 8½ months. To Malta, 17th September.	—
2nd	Loyal North Lancashire Regiment	29	28	—	—	—	—	·83	965·5	—	—	28·62	10·45	10·82	Cyprus, 3½ months. From Malta, 17th September.	—
2nd	Royal West Kent Regiment ...	131	118	4	—		—	7·54	900·8	30·53	—	57·56	21·01	23·32	Alexandria, 1½ months. To England, 19th February.	—
1st	Seaforth Highlanders	862	715	2	—		19	41·61	829·5	2·32	22·04	48·27	17·62	21·24	Cairo, 12 months. Detachment at Khartoum, 5 months.	3
1st	Cameron Highlanders	126	77	1	—		3	5·30	611·1	7·94	23·81	42·06	15·35	25·12	Cairo, 2 months. To South Africa, 3rd March.	—
	Mounted Infantry...	110	114	—	—	—	—	5·05	1036·4	—	—	45·91	16·76	16·17	Cairo, 12 months	Various.
	Other Infantry	3	2	—	—	—	—	·48	666·7	—	—	160·00	58·40	86·07		
	Total	2,045	1,776	17	1	18	48	110·70	868·5	8·80	23·47	54·13	19·76	22·75		
	Militia.															
3rd	Seaforth Highlanders	602	520	2	—	2	5	24·44	863·8	3·32	8·31	40·60	14·82	17·16	Cairo, 10 months. From England, 1st March.	—

Battery, Company, or Battn.	Corps and Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths. In the Command.	Deaths. Of Invalids.	Deaths. Total.	Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength. Admitted.	Ratio per 1,000 of Strength. Died.	Ratio per 1,000 of Strength. Invalided.	Ratio per 1,000 of Strength. Constantly Sick.	Sick Time to each Soldier.	Average duration of each Case of Sickness.	Stations occupied during the Year.	Completed Years of Service in the Command.
	EGYPT AND CYPRUS—*cont.*															
	Garrison Staff and Departments.												days.	days.		
	Army Service Corps	43	4	—	—	—	1	·31	93·0	—	23·26	7·21	2·63	28·29	Cairo, Alexandria, Cyprus and Khartoum, 12 months.	Various.
	Royal Army Medical Corps ...	56	10	—	—	—	—	·46	178·6	—	—	8·21	3·00	16·79	Cairo, Alexandria, Cyprus and Khartoum, 12 months.	Various.
	Army Ordnance Corps	48	14	—	—	—	—	1·14	291·7	—	—	23·75	8·67	29·71	Cairo, Alexandria, Cyprus and Khartoum, 12 months.	Various.
	Army Pay Corps	10	5	1	—	1	—	·54	500·0	100·00	—	54·00	19·71	39·42	Cairo, Alexandria, Cyprus and Khartoum, 12 months	Various.
	Garrison Staff, &c.	52	14	—	—	—	2	·98	269·2	—	38·42	18·85	6·88	25·55	Cairo, Alexandria, Cyprus and Khartoum, 12 months.	Various.
	Total	209	47	1	—	1	3	3·43	224·9	4·78	14·35	16·41	5·99	26·64		
	Grand Total	3,767	2,934	25	1	26	68	174·55	778·9	6·90	18·05	46·34	16·91	21·71		

ABSTRACT No. XXX.—TABLE showing the ADMISSIONS, MORTALITY, and INVALIDING in each CORPS serving in INDIA during the Year 1900.

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Daily Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.
						Admissions into Hospital.	Deaths.	Invalids.	Average Daily Sick.				
CAVALRY.										days.	days.		Yrs. ms.
4th Dragoon Guards	545	499	6	8	38·25	915·6	11·01	14·68	70·18	25·62	27·98	Rawal Pindi, 12 months; Dett. Lower Topa, 5½ months ...	6 3
3rd Hussars	518	643	12	12	45·21	1241·3	23·17	23·17	87·28	31·86	25·66	Lucknow, 11½ months; Practice camp, ½ month... ...	2 3
4th ,, ...	530	638	11	33	41·66	1203·8	20·75	62·26	78·60	28·69	23·83	Secunderabad, 12 months; Dett. Bangalore, 12 months	4 3
15th ,, ...	454	695	8	8	39·39	1530·8	17·62	17·62	86·76	31·67	20·69	Meerut, 11½ months; Practice camp, ½ month; Dett. Chakrata, 7½ months.	1 2
20th ,, ...	556	728	17	16	41·12	1309·4	30·58	28·78	73·96	26·99	20·62	Mhow, 12 months	5
Total	2,603	3,203	54	77	205·63	1230·5	20·75	29·58	79·00	28·83	23·43		
ARTILLERY.													
B Battery, R.H.A.	80	61	1	1	3·71	762·5	12·50	12·50	46·38	16·93	22·20	Lucknow, 6½ months; Practice camp, 1 month (left for China Expedition on the 10th August).	10
C ,, ,, ...	131	180	3	6	10·58	1374·0	22·90	45·80	80·76	29·48	21·45	Mhow, 12 months	11 2
D ,, ,, ...	144	154	2	4	6·59	1069·4	13·89	27·78	45·76	16·70	15·62	Umballa, 12 months	2 1
E ,, ,, ...	151	140	2	8	8·63	927·2	13·25	52·98	57·15	20·86	22·50	Kirkee, 12 months	1 2

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Daily Sick.	Ratio per 1,000 of Strength.				Average sick time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the year.	Years of Service in India.
						Admissions into Hospital.	Deaths.	Invalids.	Average Daily Sick.				
ARTILLERY—*cont.*										days.	days.		Yrs. ms.
F Battery, R.H.A.	140	118	3	5	8·80	842·9	21·43	35·71	62·86	22·94	27·22	Sialkot, 12 months	5 3
H ,, ,, ...	96	98	3	9	6·66	1020·8	31·25	93·75	69·38	25·32	24·81	Meerut, 11 months; Practice camp, 1 month	11 2
I ,, ,, ...	141	204	2	—	8·83	1446·8	14·18	--	62·62	22·86	15·80	Umballa, 12 months	7 2
J ,, ,, ...	2	4	—	4	·24	2000·0	--	2000·00	120·00	43·80	21·90	Bangalore, ½ month (left for South Africa on the 8th January).	2 2
K ,, ,, ...	147	152	2	3	8·68	1034·0	13·61	20·41	59·05	21·55	20·84	Rawal Pindi, 12 months	9 2
L ,, ,, ...	109	122	—	5	7·11	1119·3	--	45·87	65·23	23·81	21·27	Secunderabad, 12 months	8 2
1st Battery, R.F.A.	147	131	—	6	6·77	891·2	--	40·82	46·05	16·81	18·86	Kirkee, 12 months	5 0
3rd ,, ,, ...	129	112	3	1	5·72	868·2	23·26	7·75	44·34	16·18	18·64	Campbellpore, 11½ months; Practice camp, ½ month ...	4 3
6th ,, ,, ...	122	138	1	4	7·51	1131·1	8·20	32·79	61·56	22·47	19·86	Cawnpore, 10½ months; Practice camp, 1½ months ...	9 2
11th ,, ...	126	157	1	8	9·61	1246·0	7·94	63·49	76·27	27·84	22·34	Mian Mir, 12 months	3 1
12th ,, ,, ...	68	59	1	4	5·46	867·6	14·71	58·82	80·29	29·31	33·78	Jullundur, 6 months (left for China Expedition on the 28th June).	1 7
15th ,, ,, ...	130	123	7	10	7·53	946·2	53·85	76·92	57·92	21·14	22·35	Meerut, 10½ months; Practice camp, 1½ months	13 0
16th ,, ,, ...	133	86	2	6	6·02	646·6	15·04	45·11	45·26	16·52	25·55	Kirkee, 12 months	4 11
22nd ,, ,, ...	131	253	2	8	15·35	1931·3	15·27	61·07	117·18	42·77	22·15	Mhow, 12 months	14 0
23rd ,, ,, ...	121	119	8	6	8·51	983·5	66·12	49·59	70·33	25·67	26·10	Secunderabad, 12 months	9 2
24th ,, ,, ...	130	164	3	8	8·80	1261·5	23·08	61·54	67·69	24·71	19·59	Peshawar, 11½ months; Practice camp, ½ month ...	10 2
25th ,, ,, ...	143	177	1	5	12·09	1237·8	6·99	34·97	84·55	30·86	24·93	Bangalore, 12 months	3 1

27th	,,	,,	...	...	117	255	3	7	14·54	2179·5	25·64	59·83	124·27	45·36	20·81	Neemuch, 12 months	13	2
29th	,,	,,	...	...	122	161	2	6	9·82	1319·7	16·39	49·18	80·49	29·38	22·26	Kirkee, 12 months	7	2
30th	,,	,,	...	...	138	125	1	3	9·04	905·8	7·25	21·74	65·51	23·91	26·40	Fyzabad, 10½ month ; marching, 1 month; Practice camp, ½ month.	4	2
31st	,,	,,	...	...	149	159	4	4	10·17	1067·1	26·85	26·85	68·26	24·91	23·35	St. Thomas's Mt., 12 months	12	2
32nd	,,	,,	...	...	134	176	2	9	13·39	1313·4	14·93	67·16	99·93	36·47	27·77	Jhansi, 11 months; Practice camp, 1 month	2	1
33rd	,,	,,	...	...	146	201	1	4	9·55	1376·7	6·85	27·40	65·41	23·88	17·34	Hyderabad, 12 months	9	2
34th	,,	,,	...	...	110	144	4	3	7·34	1309·1	36·36	27·27	66·73	24·36	18·60	Ahmedabad, 12 months	10	2
35th	,,	,,	...	...	143	159	—	5	8·68	1111·9	—	34·97	60·70	22·16	19·93	Karachi, 10½ months; Hyderabad, 1 month; marching, ½ month.	12	2
36th	,,	,,	...	...	110	232	5	4	12·78	2109·1	45·45	36·36	116·18	42·41	20·11	Nasirabad, 12 months	13	2
40th	,,	,,	...	...	137	161	—	7	12·87	1175·2	—	51·09	93·94	34·29	29·18	Bangalore, 12 months	7	2
41st	,,	,,	...	...	139	129	—	1	7·19	928·1	—	7·19	51·73	18·88	20·34	Lucknow, 10 months; marching, 2 months	5	2
45th	,,	,,	...	...	137	245	6	9	13·44	1788·3	43·80	65·69	98·10	35·81	20·02	St. Thomas's Mt., 2½ months; Barrackpore, 9 months; Calcutta, ½ month; marching, ½ month.	7	2
46th	,,	,,	...	...	130	91	2	2	4·76	700·0	15·38	15·38	36·62	13·36	19·09	Dinapore, 9½ months; Practice camp, 1 month; marching, 1½ months.	10	2
47th	,,	,,	...	...	127	293	3	5	15·06	2307·1	23·62	39·37	118·58	43·28	18·76	Ferozepore, 12 months	9	1
48th	,,	,,	...	...	140	192	3	13	12·91	1371·4	21·43	92·86	92·21	33·66	24·54	Calcutta, ½ month ; Barrackpore 2 months ; St. Thomas's Mt., 9 months ; marching, ½ month.	13	2
49th	,,	,,	...	...	132	134	2	8	10·97	1015 2	15·15	60·61	83·11	30·33	29·88	Belgaum, 10½ months ; Madras manœuvres, 1½ months	9	2
50th	,,	,,	...	...	149	146	4	—	10·35	979·9	26·85	—	69·46	25·35	25·87	Agra, 10½ months ; Practice camp, 1 month ; marching, ½ month.	14	0
51st	,,	,,	...	...	137	140	1	6	9·99	1021·9	7·30	43·80	72·92	26·62	26·05	Rawal Pind 12 months	10	2
52nd	,,	,,	...	...	136	180	4	7	13·01	1323·5	29·41	51·47	95·66	34·92	26·38	Jubbulpore, 11 months; Practice camp, 1 month ...	3	2
54th	,,	,,	...	...	129	132	3	10	7·50	1023·3	23·26	77·52	58·14	21·22	20·74	Meerut, 11 months ; Practice camp, 1 month	10	2
55th	,,	,,	...	...	135	168	3	7	7·41	1244·4	22·22	51·85	54·89	20·03	16·10	Saugor, 10½ months; Practice camp, 1 month ; marching, ½ month.	12	2
57th	,,	,,	...	...	136	195	7	6	9·61	1433·8	51·47	44·12	70·66	25·79	17·99	Mian Mir, 12 months	4	1
58th	,,	,,	...	...	126	224	1	4	14·61	1777·8	7·94	31·75	115·95	42·32	23·81	Kamptee, 12 months	2	1
60th	,,	,,	...	...	136	113	3	8	7·92	830·9	22·06	58·82	58·24	21·26	25·58	Allahabad, 12 months	14	0

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Daily Sick.	Ratio per 1,000 of Strength.				Average Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.
						Admissions into Hospital.	Deaths.	Invalids.	Average Daily Sick.				
ARTILLERY—*cont.*										days.	days.		Yrs. ms.
70th Battery, R.F.A.	136	116		—	6·72	852·9	—	—	49·41	18·04	21·14	Bareilly, 10⅔ months; marching, 1⅓ months	14 1
71st ,, ,, ...	143	158	3	8	9·11	1104·9	20·98	55·94	63·71	23·25	21·05	Multan, 12 months	13 0
72nd ,, ,, ...	124	161	3	10	10·22	1298·4	24·19	80·65	82·42	30·08	23·17	Bellary, 12 months	12 2
80th ,, ,, ...	143	151	1	4	9·88	1055·9	6·99	27·97	69·09	25·22	23·88	Nowgong, 11 months; Practice camp, 1 month	4 1
No. 1 Battery, Mtn. Div., R.G.A.	93	68	—	—	3·56	731·2	—	—	38·28	13·97	19·11	Peshawar, 1 month; Rawal Pindi, 3½ months; Nowshera, ½ month; Peshawar manœuvres, ½ month; Bara Gali, 6 months; marching, ½ month.	17 2
,, 2 ,, ,, ,, ,,	106	93	1	1	6·45	877·4	9·43	9·43	60·85	22·21	25·31	Rawal Pindi, 5 months; Khyra Gali, 6½ months; marching, ½ month.	14 11
,, 3 ,, ,, ,, ,,	104	77	--	—	4·27	740·4	—	—	41·06	14·99	20·24	Rawal Pindi, 5½ months; Kalabagh, 5½ months; marching, ½ month.	22 1
,, 5 ,, ,, ,, ,,	95	76	—	1	4·64	800·0	—	10·53	48·84	17·83	22·28	Rawal Pindi, 2 months; Umballa, 3 months; Jutogh, 6½ months; marching, ½ month.	22 1
,, 6 ,, ,, ,, ,,	103	90	—	1	3·74	873·8	—	9·71	36·31	13·25	15·17	Umballa, 4½ months; Jutogh, 7 months; marching, ½ month.	15 2
,, 7 ,, ,, ,, ,,	105	69		—	8·22	657·1	9·52	—	78·29	28·57	43·48	Quetta, 12 month	14 10
,, 8 ,, ,, ,, ,,	102	58		1	3·04	568·6	—	9·80	29·80	10·88	19·13	Darjeeling, 10½ months; Practice camp, 1½ months ...	13 2
,, 9 ,, ,, ,, ,,	91	120		6	8·00	1318·7	—	65·93	87·91	32·09	24·33	Mandalay, 10 months; Maymyo, 2 months	16 2
,, 1 Battery Estn. Div., R.G.A.	101	38	2	1	7·26	1366·3	19·80	9·90	71·88	26·24	19·20	Fort Allahabad, 12 months	12 0
,, 3 ,, ,, ,, ,,	121	158	4	3	8·47	1305·8	33·06	24·79	70·00	25·55	19·57	Rangoon, 12 month	6 2
,, 4 ,, ,, ,, ,,	157	66		3	3·75	420·4	6·37	19·11	23·89	8·72	20·74	Karachi, 12 months	12 0
,, 7 ,, ,, ,, ,,	82	88	3	5	5·28	1073·2	36·59	60·98	64·39	23·50	21·90	Multan, 12 months	1 1

,, 8 ,, ,, ,, ,,	128	106	2	4	8·27	828·1	15·63	31·25	64·61	23·58	28·48	Aden, 12 months...	13	2
,, 9 ,, ,, ,, ,,	130	116	1	5	6·58	892·3	7·69	38·46	50·62	18·47	20·70	Calcutta, 12 months	5	0
,, 13 ,, ,, ,, ,,	126	84	2	4	6·80	666·7	15·87	31·75	53·97	19·70	29·55	Bombay, 12 months	14	1
,, 24 ,, ,, ,, ,,	123	284	9	7	12·91	2308·9	73·17	56·91	104·96	38·31	16·59	Fort Chingrikhal, 1 month; Delhi, 10¾ months; marching, ¼ month.	6	0
,, 26 ,, ,, ,, ,,	136	103	1	—	6 34	757·4	7·35	—	46·62	17·02	22·47	Bombay, 12 months	6	2
No. 5 Battery, Sthn. Div., R.G.A.	126	170	1	5	12·85	1349·2	7·94	39·68	101·98	37·22	27·59	Agra, 12 months	13	2
,, 6 ,, ,, ,, ,,	125	133	3	1	7·44	1064·0	24·00	8·00	59·52	21·72	20·42	Roorkee, 11½ months; Practice camp, ½ month	1	11
,, 9 ,, ,, ,, ,,	125	131	—	9	8·13	1048·0	—	72·00	65·04	23·74	22·65	Roorkee, 11 months; Practice camp, 1 month	13	2
,, 11 ,, ,, ,, ,,	120	136	2	9	10·31	1133·3	16·67	75·00	85·92	31·36	27·67	Roorkee, 11 months; Practice camp, 1 month	11	1
,, 18 ,, ,, ,, ,,	142	123	2	2	5·84	866·2	14·08	14·08	41·13	15·01	17·33	Aden, 12 months	11	1
,, 23 ,, ,, ,, ,,	144	86	1	2	6·77	597·2	6·94	13·89	47·01	17·16	28·73	Quetta, 12 months	6	3
,, 24 ,, ,, ,, ,,	85	98	3	5	5·98	1152·9	35·29	58·82	70·35	25·68	22·27	Campbellpore, 11¾ months; Rawal Pindi, ¼ month ...	13	2
,, 29 ,, ,, ,, ,,	111	255	3	22	11·36	2297·3	27·03	198·20	102·34	37·35	16·26	Fort Chingrikhal, 1 month; Barrackpore, 11 months ...	2	3
,, 33 ,, ,, ,, ,,	125	115	1	2	7·17	920·0	8·00	16·00	57·36	20·94	22·76	Fort Attock, 3½ months; Rawal Pindi, 3½ months; Camp Thobba, 5½ months.	4	0
No. 4 Battery, Wstn. Div., R.G.A.	105	158	1	6	7·87	1504·8	9·52	57·14	74·95	27·36	18·18	Ferozepore, 12 months...	6	2
,, 5 ,, ,, ,, ,,	111	118	3	7	9·04	1063·1	27·03	63·06	81·44	29·73	27·96	Rawal Pindi, 9½ months; Fort Attock, 2½ months; Karachi, ¼ month.	8	2
,, 7 ,, ,, ,, ,,	81	57	2	3	3·94	703·7	24·69	37·04	48·64	17·75	25·23	Jhansi, 11 months; Practice camp, 1 month	6	2
,, 9 ,, ,, ,, ,,	86	80	—	3	4·37	930·2	—	34·88	50·81	18·55	19·94	Secunderabad, 12 months	6	2
,, 11 ,, ,, ,, ,,	119	138	1	11	3·80	1159·7	8·40	92·44	31·93	11·66	10·05	Madras, 12 months	13	2
,, 16 ,, ,, ,, ,,	137	106	2	3	5·77	773·7	14·60	21·90	42·12	15·37	19·87	Aden, 12 months	13	2
,, 18 ,, ,, ,, ,,	122	115	1	5	7·80	942·6	8·20	40·98	63·93	23·34	24·76	Bombay, 12 months	6	2
,, 22 ,, ,, ,, ,,	124	143	1	8	8·48	1153·2	8·06	64·52	68·39	24·96	21·64	Rangoon, 12 months	15	2
,, 25 ,, ,, ,, ,,	136	105	—	3	9·22	772·1	—	22·06	67·79	24·74	32·05	Quetta, 12 month	3	0
Total	10,289	11,554	172	419	695·76	1122·9	16·72	40·72	67·62	24·68	21·98			

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Daily Sick.	Ratio per 1,000 of Strength.				Average Time Sick to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the year.	Years of Service in India.
						Admissions into Hospital.	Deaths.	Invalids.	Average Daily Sick.				
ROYAL ENGINEERS.													
H Company, Royal Engineers ...	100	56	1	7	3·05	560·0	10·00	70·00	30·50	11·13	19·88	Calcutta, Roorkee, Bangalore, Rangoon, Kirkee, Bombay, and Aden.	33 0
INFANTRY.													
2nd Royal Scots	1,013	1,356	24	39	90·03	1289·2	23·69	38·50	89·76	32·76	25·41	Poona, 12 months; Dett. Kirkee, 12 months	8 9
1st Royal West Surrey Regiment	875	520	3	24	41·54	594·3	3·43	27·43	47·47	17·33	29·16	Rawal Pindi, 5 months; Kuldana, 6½ months; marching, ½ month.	5 11
1st East Kent Regiment	961	1,228	13	20	78·61	1277·8	13·53	20·81	81·80	29·86	23·37	Kamptee, 12 months; Dett. Sitabaldi, 12 months ...	13 9
1st Royal Warwickshire Regt. ...	911	1,475	9	28	94·46	1619·1	9·88	30·74	103·69	37·85	23·37	Madras, 12 months; Wing Bellary, 11 months; Belgaum, 1 month; Dett. Wellington, 12 months; Palaveram, 8 months.	2 2
1st Royal Fusiliers	937	1,731	44	64	90·69	1847·4	46·96	68·30	96·79	35·33	19·12	Nasirabad, 11 months; Sea voyage, ½ month; Mandalay, ½ month; Dett. Neemuch, 11 months; Taragarh, 7 months.	13 0
1st Norfolk Regiment	928	1,079	10	47	69·50	1162·7	10·78	50·65	74·89	27·34	23·51	Bombay, 12 months; Dett. Deesa, 12 months; Ahmedabad, 12 months.	11 10
1st Lincolnshire Regiment ...	1,017	1,023	25	17	67·58	1005·9	24·58	16·72	66·45	24·25	24·11	Secunderabad, 12 months	2 2
2nd Suffolk Regiment	1,041	803	21	14	77·25	771·4	20·17	13·45	74·21	27·09	35·11	Quetta, 12 months	9 10
1st Somersetshire Light Infantry	896	653	10	20	42·00	728·8	11·16	22·32	46·88	17·11	23·48	Rawal Pindi, 6 months; Camp Gharial, 5½ months; marching, ½ month.	7 0
1st West Yorkshire Regiment ...	963	961	9	39	50·58	997·9	9·35	40·50	52·52	19·17	19·21	Karachi, 12 months; Dett. Hyderabad, 12 months ...	1 11
1st East Yorkshire Regiment ...	961	1,165	10	51	70·09	1212·3	10·41	53·07	72·93	26·62	21·96	Belgaum, 9½ months; Madras manœuvres, 1½ months; marching, 1 month; Wing Bellary, 1 month.	5 1
1st Bedfordshire Regiment ...	923	1,735	23	39	82·68	1879·7	24·92	42·25	89·58	32·70	17·39	Multan, 12 months; Wing Camp Thobba, 3 months; Dett. Mian Mir, 4 months.	10 0
2nd Royal Irish Regiment... ...	979	1,751	8	52	104·43	1788·6	8·17	53·12	106·67	38·93	21·77	Mhow, 12 months; Dett. Indore, 12 months	15 11

2nd Yorkshire Regiment	1,030	921	8	16	49·11	894·2	7·77	15·53	47·68	17·40	19·46	Umballa, 5 months; Dagshai, 6½ months; marching, ½ month.	10 11
1st Royal Scots Fusiliers	933	977	9	45	60·23	1047·2	9·65	48·23	64·56	23·56	22·50	Peshawar, 6 months; Cherat, 6 months	4 8
1st Cheshire Regiment	1,001	1,344	20	52	81·22	1342·7	19·98	51·95	81·14	29·62	22·06	Secunderabad, 12 months; Dett. Bangalore, 11½ months;	18 8
1st South Wales Borderers ...	1,034	561	8	23	46·61	542·6	7·74	22·24	45·08	16·45	30·33	Chakrata, 8½ months; Peshawar, 1½ months; Practice camp, 2 months; marching, ½ month.	8 0
2nd King's Own Scottish Borderers.	908	1,159	8	46	68·02	1276·4	8·81	50·66	74·91	27·34	21·42	Cawnpore, 12 months; Dett. Fatehgarh, 12 months; Chakrata, 7 months.	10 11
1st Scottish Rifles	841	889	13	18	60·46	1057·1	15·46	21·40	71·89	26·24	24·82	Lucknow, 11 months; marching, 1 month	0 0
2nd Royal Inniskilling Fusiliers...	919	1,384	11	19	70·60	1506·0	11·97	20·67	76·82	28·04	18·62	Mian Mir, 4½ months; Dalhousie, 6½ months; marching, 1 month; Wing Jullundur, 3 months; Mian Mir, 4 months; Dett. Fort Lahore, 6½ months.	19 0
2nd East Lancashire Regiment ...	958	758	10	17	47·65	791·2	10·44	17·75	49·74	18·15	22·94	Bareilly, 1 month; Jullundur, 3 months; Dalhousie, 7½ months; marching, ½ month; Wing Solon, 6½ months; Dett. Camp Thobba, 6 months.	8 0
1st East Surrey Regiment ...	797	627	9	16	43·29	786·7	11·29	20·08	54·32	19·83	25·20	Lucknow, 4 months; Chaubuttia, 7½ months; marching, ½ month.	15 11
1st Duke of Cornwall's Light Infantry.	814	1,138	27	25	63·09	1398·0	33·17	30·71	77·51	28·29	20·24	Lucknow, ½ month; Calcutta, ½ month; Dum Dum, 10½ months; left for Ceylon on the 21st December; Dett. Barrackpore, 10½ months.	12 10
2nd West Riding Regiment ...	844	1,132	15	45	77·99	1341·2	17·77	53·32	92·41	33·73	25·15	Rangoon, 12 months; Dett. Fort Blair, 12 months; Meiktila, 11½ months.	8 0
2nd Border Regiment	924	917	4	30	57·17	992·4	4·33	32·47	61·87	22·58	22·76	Bareilly, 12 months; Dett. Ranikhet, 6 months ...	10 10
2nd Royal Sussex Regiment ...	920	733	6	11	40·99	872·4	6·60	12·10	45·09	16·46	18·87	Sialkot, 5½ months; Camp Thobba, 5½ months; marching, 1 month; Dett. Amritsar, 12 months.	16 0
1st Hampshire Regiment	930	1,029	15	29	59·55	1083·2	15·79	30·53	62·68	22·88	21·12	Peshawar, 11 months; Nowshera, 1 month; Dett. Khanspur, 5½ months.	14 11
2nd South Staffordshire Regiment	1,019	1,185	17	27	72·46	1162·9	16·68	26·50	71·11	25·95	22·32	Umballa, 5½ months; Subathu, 6½ months; Dett. Dagshai, 6½ months; Jutogh, 8½ months.	4 2
1st Warwickshire Regiment. ...	1,011	1,022	9	35	68·34	1010·9	8·90	34·62	67·60	24·67	24·41	Nowshera, 11 months; marching, 1 month; Dett. Fort Attock, 11 months; Khanspur, 5½ months.	7 8
2nd South Lancashire Regiment ...	929	1,400	14	32	80·33	1513·5	15·07	34·45	66·47	21·56	20·85	Jubbulpore, 12 months; Dett. Saugor, 12 months ...	6 14
2nd Welsh Regiment	845	963	10	11	64·45	1163·3	11·53	13·02	76·27	27·84	23·93	Ahmednagar, 10½ months; Poona, 1½ months; Dett. Satara, 12 months.	4 8
1st Royal Highlanders	904	829	8	17	45·92	912·6	8·85	18·81	50·80	18·54	20·32	Sitapur, 12 months; Wing Benares, 12 months	4 14
2nd Oxfordshire Light Infantry	963	1,939	22	32	97·77	2013·3	22·84	54·00	101·53	37·06	18·45	Fermepore, 12 months; Wing Karachi, 1½ months; Dett. Dalhousie, 12 months.	14 9
2nd York Regiment	909	896	6	38	51·61	1074·4	7·44	47·15	64·28	23·46	21·84	Sherbro, 12 months; Dett. Thayetmyo, 12 months; Rhamo, 12 months.	4 2
1st Northamptonshire Regiment.	810	794	10	22	34·38	982·2	12·35	27·16	67·75	24·73	25·23	Allahabad, 12 months; Dett. Fort Allahabad, 12 months. Fyzabad, 12 months.	4 2

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Daily Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the year.	Years of Service in India.
						Admissions into Hospital.	Deaths.	Invalids.	Average Daily Sick.				
INFANTRY—*cont.*										days.	days.		Yrs. ms.
1st Royal West Kent Regiment ...	660	1,286	11	27	53·76	1948·5	16·67	40·91	81·45	29·73	15·26	Aden, 12 months	8 11
1st King's Shropshire Light Infantry.	987	830	14	13	56·79	840·9	14·18	13·17	57·54	21·00	24·97	Poona, 12 months	6 0
1st Middlesex Regiment	861	683	9	26	40·98	793·3	10·45	30·20	47·60	17·37	21·90	Wellington, 12 months; Detts. Cannanore, 12 months; Calicut, 12 months; Malapuram, 12 months.	2 9
1st Wiltshire Regiment	1,087	773	19	11	64·46	711·1	17·48	10·12	59·30	21·64	30·44	Quetta, 12 months	5 3
1st North Staffordshire Regiment	1,126	1,201	17	12	88·68	1066·6	15·10	10·66	78·76	28·75	26·95	Jhansi, 12 months; Dett. Nowgong, 12 months... ...	3 2
2nd York and Lancaster Regiment.	997	1,082	9	10	93·18	1085·3	9·03	10·03	93·46	34·11	31·43	Agra, 12 months	3 10
2nd Durham Light Infantry ...	771	1,795	23	71	98·02	2328·1	29·83	92·09	127·13	46·40	19·93	Mandalay, 11½ months; Sea voyage, ½ month	14 0
1st Royal Irish Rifles	887	1,301	23	86	81·06	1466·7	25·93	96·96	91·39	33·36	22·74	Calcutta, 12 months; Dett. Dum Dum, 4 months; Meerut, 2½ months.	1 8
2nd Connaught Rangers	1,000	1,680	11	30	88·64	1680·0	11·00	30·00	88·64	32·35	19·26	Meerut, 11 months; Practice camp, 1 month; Dett. Chakrata, 7 months; Delhi, 10 months.	13 0
2nd Argyll and Sutherland Highlanders.	863	605	4	26	52·70	701·0	4·63	30·13	61·07	22·29	31·79	Bareilly, 3½ months; Ranikhet, 8½ months; marching, ½ month.	9 0
2nd Royal Munster Fusiliers ...	879	797	10	32	49·32	906·7	11·38	36·41	56·11	20·48	22·59	Dinapore, 11½ months; Practice camp, ½ month... ...	16 9
3rd Rifle Brigade	888	498	8	13	40·73	560·8	9·01	14·64	45·87	16·74	29·85	Rawal Pindi, 12 months; Dett. Upper Topa, 5½ months	11 10
Total	43,560	50,610	626	1,437	3130·60	1161·8	14·37	32·99	71·87	26·23	22·58	Various Station Hospitals.	
Depôts of various corps whose Head Quarters are serving in South Africa.	383	392	8	43	25·72	1023·5	20·89	112·27	67·15	24·51	23·95		

Garrison Staff and Departments	3,512	3,362	23	43	280·95	963·0	6·55	12·24	80·00	29·20	30·32	
Men of various Corps marching	106	38	1	—	·50	264·2	9·43	—	4·72	1·72	6·52	
Grand Total...	60,543	69,225	885	2,626	4342·21	1143·2	14·62	33·46	71·71	26·17	22·90	

APPENDICES.

APPENDIX No. I.

REPORT ON THE PROGRESS OF HYGIENE FOR THE YEAR 1900-1.

By Major R. H. FIRTH, Royal Army Medical Corps, Professor of Military Hygiene at the Army Medical School, Netley.

The chief features of hygiene which have attracted attention during the year under review may be summarized briefly as follows :—

I.—*Legislation and Statutory Orders.*

Factory and Workshop Act, 1901.—No Act of sanitary importance has been placed upon the Statute Book except this, which amends as well as consolidates the law. It will be found on working to have improved the conditions of labour, especially in the direction of sanitary supervision and the diminution of industrial diseases.

The more important sanitary provisions of this Act are, (1) as to ventilation and overcrowding; the pre-existing Acts dealt with obnoxious gases and dust, but did not deal with the amelioration of the conditions existing in the crowded rooms in which girls are often compelled to work with gas jets burning, and in which the air was rarely changed. These workplaces are brought within the Act, and, though it does not lay down any particular form for ventilation, it requires that in all workshops and factories sufficient ventilation shall be provided and maintained, the standard of such sufficient ventilation being in accordance with such rules as the Secretary of State may issue by Special Order in respect of any class of factory or workshop. Overcrowding is deemed to exist if during ordinary work hours each person has less than 250 cubic feet of space, and during periods of overtime less than 400; (2) Another useful provision of this Bill relates to bakehouses, and provides that no bakehouse shall be used as such, unless established prior to 1894, if the floor be more than three feet below the soil surface, and further places on the local authority the responsibility of seeing that all such bakehouses are in a sanitary condition and in other respects suitable for the trade carried on there; (3) A number of industries and works, previously exempt, are brought within the operation of the Act, such as electrical and cognate works, and the processes of fruit preserving and fish curing; (4) One of the most important features of this Bill is that laundries are now definitely scheduled as workshops. It is, on sanitary grounds, regrettable that religious and charitable institutions where laundry work is carried on are not included in this provision.

Regulations for Milk Standards, 1901.—As an outcome of the Report of a departmental committee appointed by the Board of Agriculture to inquire into the desirability of making regulations as to the sale of milk and cream an Order by the Board under Section 4 of the Sale of Food and Drugs Act, 1899, came into force on 1st September, whereby a presumption is raised that milk (not being sold as skimmed. or separated, or condensed milk) is not genuine unless it contains 3 per cent. of milk fat and 8·5 per cent. of milk solids other than milk fat. Further, where a sample of skimmed or separated milk (not being condensed milk) contains less than 9 per cent. of

milk solids, it shall be presumed, until the contrary be proved, to be not genuine. By this order, the principle of standards for food becomes officially recognized, and this experiment in legislation will be watched with interest. The idea of adopting a milk standard has been discussed for some time, especially by public analysts who have long insisted upon the need of having a legal limitation, if the evidence of analysis is not to be brought into discredit. The standards now promulgated have for years been adopted as minimal limits by the Society of Public Analysts, and generally accepted as satisfactory in this and other countries. It is well known, of course, that milk occasionally falls below this standard, even when absolutely genuine: but such cases are exceptional and abnormal. In the experience of those who deal every day with the composition of a variety of milk the limit of 3 per cent. of fat is most reasonable for the mixed milk of the whole herd. Genuine milk rarely, if ever, falls below this limit.

Regulations for Public Health Examinations.—These regulations, which come into force at the beginning of 1902, may be briefly stated thus: The conditions of Part I, which includes the laboratory work, remain the same. The conditions of Part II undergo material change. Thus the preparation of the candidates is to include not only attendance for three months at a fever hospital but also a short apprenticeship of six months to certain specified officers, who have the opportunity and facilities of giving the pupil an insight into the business of public health administration. This is a very important and far-reaching change, as the specified officers are only the medical officers of health of the larger towns; the population limits being 50,000 for England and Wales, and 30,000 for Scotland and Ireland. If this new rule is properly carried out and if uniformity is strictly insisted on at the various examining boards, the effect will be to largely reduce the number of diplomates. The public is not likely to suffer, as the net result of the new regulations will mean the gradual evolution of a highly trained and scientific body of men prepared to devote themselves wholly to sanitary work. Possibly some of the universities and corporations will cry out as they find their receipts in fees from candidates falling off, but the general result will undoubtedly be for the best, and an increase in quality secured by a diminution in quantity.

II.—*Special Points of Hygiene.*

Although the year 1900–01 has not been remarkable for any great discovery in the domain of hygiene, still during the period under review considerable progress has been made in several branches. The more important facts which appear to me to be worthy of special note are the following:—

Natural Resistance and Specific Immunity against Infection.—These fascinating problems have received much attention during the year, but can hardly yet be said to be completely understood. The more recent work by Buchner, Grüber, Pfeiffer, Ehrlich, Bordet, Wassermann and others suggests the following summary:

Since Metchnikoff enunciated his phagocytic theory of immunity, many facts have been found which cannot be explained by it. The chief of these is that bacteria can be observed to disappear from the peritoneal cavity of a naturally resistant animal without any evidence of phagocytosis. The result has been that natural resistance against infection is now regarded as being dependent principally upon the microbicidal power of the juices and of certain cells of the organism, and upon their richness in certain hypothetical substances known as alexins. Grüber and Pfeiffer from their experiments have suggested that any power which the blood serum or other juices of cells in the organism acquires or possesses of killing and dissolving bacteria is due to two substances. One is known as "the immune, or intermediate body" the other as "the complement." The former is found only in the serum of an artificially immunized animal, while the latter is found alike in the serum of an artificially immunized or a naturally immune animal.

As a result of Ehrlich's work in this field, it has been shown that it is further possible to produce what he calls "anti-complements," or substances

which have the power of neutralizing and combining with the complements. Thus, if a rabbit receive several injections of guinea pig's serum, the serum of that rabbit will contain substances which neutralize the complements of the guinea pig's blood ; this is shown by the effect of guinea pig's serum upon rabbit's red blood discs. Under normal circumstances the rabbit's red blood cells are hæmolysed by the guinea pig's serum, but if a certain proportion of a rabbit's blood previously treated with guinea pig's serum be added to normal guinea pig's serum before mixing with the rabbit's red discs, no hæmolysis will take place. Some researches by Wassermann have further shown that these complements play an active part in the incidents of natural resistance against infection. He shows that if an animal be treated with a sub-lethal dose of bacteria, the bacteria will quickly disappear, and the animal survive. Assuming that the active agents in this disappearance of the bacteria are the complements, then the combination of the complements with the anti-complements should make the sub-lethal dose a lethal one. This sequence of events he has demonstrated to actually occur. A normal guinea pig was treated with a sub-lethal dose of enteric bacilli mixed with 3 c.c. of normal rabbit's serum by injection into the peritoneal cavity ; the animal recovered quickly, and the bacteria disappeared rapidly from the peritoneal cavity. Into another guinea pig was injected the same dose of enteric bacilli, but in place of being mixed with normal rabbit's serum, it was mixed with 3 c.c. of serum from a rabbit which had had many injections of normal guinea pig's blood, and which therefore contained the anti-complements of the guinea pig. Soon after the injection, it was found that the bacilli had increased in the peritoneal cavity, and the animal died within a few days. Repetition of this experiment gave the same results.

The only conclusion to be drawn is that the presence of the complements is a material factor in natural resistance, and Wassermann points out that in attempting to judge the bearing these experiments have upon practical preventive medicine, we must endeavour to find out whether the amount of these complements can be increased, and whether any easy and accurate method can be devised for the quantitative estimation of the specific complements. If answers can be obtained to these two points, we shall have advanced to a position of estimating an individual's power of resistance against certain diseases.

As regards Specific Immunity, we owe some knowledge to Buchner, who makes three divisions of this condition ; (1) specific antitoxic immunity, (2) specific bactericidal immunity, and (3) specific hæmolytic immunity. These three types of specific immunity are capable of production by preparatory treatment. In the case of (1) by means of specific toxins or non-toxic modifications ; in the case of (2) by means of specific bacteria, living or dead ; in the case of (3) by specific red blood cells, fresh or heated to 60° C.

In all these cases, there appears in the blood and serum of animals treated a specific "anti" body which is not destroyed by a temperature of 65° C. In the case of type (1) we have well known examples in the antitoxins contained in anti-diphtheria and anti-tetanus sera. In types (2) and (3) the specific "anti" body produces no immediately visible effect, but works rather in combination with the non-specific alexins. We must not assume the existence of specific bactericidal substances or of specific hæmolytic substances, but believe rather that in both cases we have to do with a combined effect, the bacteria and red blood cells being as it were predisposed to the effect of normal alexins by the action of specific antagonistic bodies. It appears to be indifferent whether these alexins proceed from the same species of animals in which the antagonistic body has been produced by a specific treatment, or from another species. In the case of specific hæmolytic immunity experiments show that the predisposing effect depends on an attraction and combination between the antagonistic body and the specific red cells in consequence of which the latter are more readily dissolved by the normal alexins. There is reason to believe that the conditions are the same in specific bactericidal immunity. The true principle of specific immunity, therefore, in all cases consists in the special attraction and combination between the "anti" body and the object of specific reaction, be it toxins, bacteria or red blood cells.

The difficulty still remains for solution as to what is the nature and origin of the antagonistic bodies and what is the real nature of the specific combination which evidently takes place between the "anti" body and the object of reaction. We must not confuse natural resistance with specific immunity, they differ in principle, the former being characterized by or due to alexins in the blood and body juices, the latter by specific antagonistic substances. The alexins are destroyed at 60° C., and differ according to the animal species which produces them, showing no attraction towards the object of reaction. The "anti" bodies are still stable at 65° C., do not differ according to the animal species that produces them, but display a specific attraction towards the object of reaction which has been employed in the preparatory treatment. Both alexins and antagonistic bodies probably act in the same organism concurrently, natural resistance and specific immunity combining their effects; the one may re-inforce the other.

The Census Returns, 1901.—The current year is noteworthy as having been the occasion of taking the first census of the British Isles in the new century. As yet only a preliminary report has been issued, but it is sufficiently detailed to afford interesting and instructive facts.

The report shows a population at midnight on March 31st, 1901, of 32,525,716 living in England and Wales, of 4,471,957 living in Scotland, and of 4,456,546 living in Ireland, or a total population for the United Kingdom of 41,454,219. These figures show that in England and Wales the decennial rate of increase varied from 15·8 per cent. in 1821-31 to 11·6 in 1891-1901. In Scotland it varied from 6·0 per cent. in 1851-61 to 11·2 in 1871-81 and 11·1 per cent. in this last decade. In Ireland, only the two earliest decades since 1821 show any increase, and in this decade we find that the population has declined 5·3 per cent., as against 9·1 per cent. in the preceding ten years. On the total population of the United Kingdom the percentage increase is 10·8 as compared with 10·8 and 8·2 respectively in the two preceding decennia. It is noticeable that the population of Scotland has steadily remained about 10 per cent. of that of the United Kingdom, while that of Ireland has steadily declined from 32·6 per cent. to 10·8 of the total for the United Kingdom.

The increase of population is obviouly made up of two separate factors, namely the balance of births over deaths and the balance (if any) of immigration over emigration. In the decennium 1881-91 the excess of births over deaths, or the natural increase of population, was 13·97 per cent., in 1891-1901 it was but 12·39 per cent. Notwithstanding the decline in the natural increase, which appears to be due to a decline in the birth-rate, the excess of enumerated over estimated population is considerable. It is clear, therefore, that there must have been a reduction in the loss of population by excess of emigration over immigration. This loss due to excess of emigration has evidently been lower in this last ten years than in any recent decade. The favourable total increase in population is certainly a satisfactory feature of the census, but before it can be decided how far it is due to lessened emigration or to a lowered death-rate or both combining to counteract the effect produced by a diminished birth-rate, some further details as to our national vital statistics, especially for 1900, must be forthcoming.

Of the total population, the proportion between the two sexes is 106·9 females to 100 males. This relative excess of females has been going on steadily since 1851. Some interesting facts as to families and inhabited houses are available. The average number of persons to a family is given as 4·61 as against 4·73 in 1891. This diminution may be due partly to greater care in the issuing of schedules to heads of families as distinguished from heads of houses, and partly to the lessened rate of natural increase. Inhabited houses have increased 15 per cent., while the population has increased only 10·8 per cent; the average number of occupants to each inhabited house was 5·19 as compared with 5·32 in 1891; whether this is due to sanitary operations diminishing overcrowding, or to a decrease in the mean number of persons to a family, or to both causes is uncertain. One of the most remarkable facts brought out by the census is the increase in urban populations over rural. This percentage increase is greatest in the urban districts having a population between 100,000 and 250,000; the next greatest increase has been in the urban districts having a population between 10,000

and 15,000, while the towns with a population over a quarter of a million show a lower rate of increase. The partial explanation of this is that, as a great town increases it swarms over its borders, and gradually forms around it a ring of smaller urban districts: to this must be added the effect of a steadily declining birth-rate.

Perhaps, from the vital statistician's point of view, one of the most striking lessons to be drawn from this census report is the degree of accuracy of estimates of populations. The differences between estimated and enumerated populations are in some cases most forcible. The official method of estimation of population certainly gives approximately accurate results for the whole country, but cannot be trusted for individual towns, and with a declining birth-rate is becoming more and more untrustworthy. As examples one may give the following towns, whose enumerated populations differ more than 10 per cent. from the estimated—Newcastle-on-Tyne (*minus* 10·5 per cent.), Swansea (*minus* 11·9 per cent.), Blackburn (*minus* 15·5 per cent.), Cardiff (*minus* 18·8 per cent.), and Burnley (*minus* 19·5 per cent.). These erroneous estimates of population have obvious vitiating effects on vital statistics. Thus Burnley, which is an extreme case, had in last year 2,214 deaths, and the death-rate based on the estimated population for that year was 19·6 per mille; when worked out on the enumerated or census population it was 22·8 per mille. The only remedy is a more frequent enumeration, as offered by a quinquennial census. Possibly by 1906 an intermediate enumeration of the population may be legalized.

The Existence and Detection of Arsenic in Beer.—Probably one of the most remarkable instances of inadvertent poisoning on a large scale was the extensive outbreak of arsenical poisoning in parts of Lancashire, Cheshire, and Staffordshire occurring during the latter portion of the year 1900. The incidence and mortality appears to have been greatest in Manchester, where many medical men noticed an increase in the number of patients suffering from peripheral neuritis, many of whom presented other indefinite symptoms, not only attributable to alcohol, but rather suggestive of the action of some other toxic agent. The symptoms which appeared among the cases were nausea, sickness, silvery tongue, and irritation of the eyes, accompanied by a puffy condition of the lids and coryza. These symptoms were followed by swelling, tenderness, and tingling in the feet, causing some difficulty in walking. In a certain number of cases wasting of the small muscles of the hands occurred, and some cases developed dropped wrist and an unsteady gait. A marked sign in many instances was a brownish pigmentation of the skin, accompanied by a scaly condition of the hands and feet.

The credit of first discovering that these symptoms were caused by arsenic consumed in beer or stout is due to Dr. Reynolds of Manchester. Following his representations, instructions were issued by the public health authorities for samples of beer and of saccharine materials from suspected breweries to be analyzed. These steps resulted in the discovery of arsenic in the glucoses and invert sugars emanating from one particular firm. Arsenic was found in samples of beer taken from public-houses known to have been frequented by patients. A large proportion of patients were found to have obtained their beer from breweries which had been supplied by the firm who sent out the affected sugar, and few cases failed on inquiry to be connected in one way or other with the use of brewer's sugars containing arsenic. On notification to the brewers and a withdrawal from the market of beers in which the incriminated sugar had been used, a cessation of the occurrence of fresh cases indicating symptoms of arsenical poisoning was secured, showing that the outbreak had really been due to the consumption of certain beers and stout. The amount of beer consumed in many cases was small, not more than three glasses a day, hence the quantity of arsenic must have been large or in a very poisonous form. The exact amount of arsenic found by analysis in large numbers of beer samples examined varied from under $\frac{1}{10}$ grain to just over 3 grains of arsenious oxide per gallon—the average amount was at least $\frac{1}{2}$ grain.

The extent to which arsenic had caused ill-health in Lancashire and the Midlands led to the appointment of a Royal Commission to inquire into the whole question. So far, only a preliminary report has been issued

by them. This deals with the extent of the illness caused by arsenic and with the means by which arsenic gains entrance into beer and other articles of food and drink. The Commissioners confirm the incrimination of arsenically-tainted brewing sugars. By the term "brewing sugar" is meant glucose and invert sugar obtained by the action of sulphuric or other mineral acids upon potato, maize, rice, and other starches. These sugars either take the place entirely or partly of malt in the preparation of the wort, or are used in the "priming" added after the wort has fermented. The amount of sugar used appears to vary in different brews, but the evidence seems to show that, in the process of brewing, if the contaminated sugar is added before fermentation takes place, a portion of the arsenic is removed by the action of the yeast, whereas if sugars are introduced as priming agents—that is, after fermentation—the whole of the arsenic remains in the beer. The brewing sugar had all become contaminated by arsenic in the process of manufacture through using sulphuric acid supplied by one firm. This acid contained from 1·5 to 2·5 per cent. of arsenious oxide. The firm that supplied the adulterated acid admitted in evidence that the acid contained arsenic, but stated they had no knowledge as to the use to which it was put. The amount of arsenic detected as arsenious oxide in different glucoses varied from 0·015 per cent. to 0·095 per cent., or say 1 to 6·5 grains per lb.: in other instances from 0·5 to 9 grains per pound. Some invert sugars contained from 0·02 per cent. of arsenious oxide to 0·062 per cent., or from 1·4 to 4·4 grains per pound. The contamination was therefore very considerable.

Some evidence was brought before the Commissioners by Dr. Tunnicliffe that, in addition to arsenic, beer sometimes contained selenium, and to this he was disposed to attribute some of the poisoning. This is a very interesting point, and one which apparently needs further consideration. It is a matter of common knowledge that selenium occurs together with arsenic in nearly all pyrites and the sulphuric acids prepared from them; moreover, the technical operations for the removal of arsenic do not render the acid free from selenium. The chemical properties of selenium and selenious acid render it certain that they would pass over together with the arsenic into sugar made by means of impure sulphuric acid, and thus be present in the corresponding beer. Our physiological knowledge of the effect of selenium compounds is obscure, and so far as I can find out no cases of selenium poisoning in man have been recorded, but when given to animals the general symptoms which they produce are identical with those of arsenic. In the absence of extensive physiological and pharmacological investigations on the higher animals it is impossible to say how far the presence of selenium with arsenic might modify the complex symptoms set up by the latter. The part played by selenium is probably subsidiary to that of arsenic, but the presence of selenium in beer would explain some anomalies, for on reading the literature upon this remarkable outbreak one cannot help being impressed with the incongruity between some of the doses of arsenic taken and the effects produced. The most practical conclusion to draw from the facts is that it is essential that all sulphuric acids used in the manufacture of food products should be free not only from arsenic but also from selenium.

Interesting facts have been elicited as to the various ways by which arsenic may gain entrance into beer. Not only may it be by the sugars but also by the malt, which becomes contaminated by the fumes emitted from the fuel used in drying the malt. I believe, in no instance have hops been found to contain arsenic, but in drying hops it is evident care must be exercised lest they become contaminated by fume from fuel. It has further been suggested that arsenic may be present in beers or other products in some organic (biological) combination due to the action of certain micro-organisms during fermentation; in support of this the work of Gosio has been quoted with regard to the power of a mould (*penicillium brevicaule*) to form organic gaseous substances from minute traces of solid arsenical compounds. This is an interesting side issue, but there is no evidence to show that these micro-organisms have been found in active yeast.

In attempting to take to heart such practical lessons as are suggested by

the occurrence of the arsenic poisoning epidemic of 1900–1901, we are most impressed with (1), the need of some modification in our present laws dealing with the purity of beer or stout, and (2) the need of appreciating what is the best and most reliable technique for the detection of arsenic and selenium in such food products.

Parliamentary powers exist at present whereby medical officers of health can deal with suspected articles of food, such as beer, but only when an article of sale. They appear to have no effective powers against sugar manufacturers or brewers, but only against the retailers. The Public Health Acts, though empowering authorities to condemn and destroy unsound articles of food do not do so in regard to poisoned beer. Increased statutory powers are evidently needed here. The revenue acts do not compensate for the existing loophole in the Health Acts. Possibly the remedy lies in improvement of excise administration, whereby standards of purity may be laid down for materials found upon premises visited for revenue purposes. Any such modification of existing powers will involve excise officers supervising maltings and the fuel used therein, as fumes from malting fires we know are a possible source of arsenical poisoning.

As to what are the best means for detecting and approximately estimating arsenic in malted liquors, much discussion has arisen. It has been a question which has exercised us at Netley, as a large number of beer samples have been submitted to me during the year for analysis and report as to the presence of arsenic. In no case were we able to detect any arsenic, and I believe that so far as the army has been concerned no cases of arsenical poisoning have occurred as the result of contaminated sugars being employed in making beers issued to soldiers. Though the detection of arsenic is an elementary procedure familiar to every student of chemistry, its detection in beer was an altogether novel problem, owing to the excessively small quantities often present, and to the fact that it had to be recovered from an organic medium. Arsenic, like nitrogen, is protean in its combinations, and in the operations of brewing meets with abundant opportunities for the exercise of its remarkable powers of combination. Just as there is at least one arsenic compound—namely, cacodylic acid—which is harmless though it includes about 50 per cent. of the element, so there are other compounds which are exceptionally poisonous. Underlying the usually adopted methods for the detection of arsenic are two principles, viz., those of Reinsch and of Marsh. The Reinsch principle depends on the precipitation of arsenic on metallic copper in the presence of hydrochloride acid; the Marsh principle depends on the evolution of arsine with hydrogen from zinc or other metal. The Reinsch method was specially recommended by a committee, embracing many eminent chemists, appointed on behalf of the Brewers' Association. It is questionable whether this advice was quite sound, for it is found that Reinsch's test is not reliable in all cases. Thus, if arsenic be present in the arsenic state or in organic combination (*e.g.*, cacodylic acid), no deposit is obtainable on the copper; while, on the other hand, if sulphites be present, as they often are in beers, then the copper becomes tarnished, and it is not easy to say whether arsenic was the cause of the discolouration or not, and absolute proof is only obtainable by oxidising the deposit and obtaining crystals of arsenious oxide. Even if arsenic be present in the arsenious state, under some conditions no precipitation will take place. In the presence of cane sugar, copper often fails to precipitate arsenic on its surface owing to the levulose being decomposed by the hydrochloric acid with the formation of a pumice-stone-like precipitate, which prevents the arsenic adhering to the copper. For the detection of arsenic in beer, I am disposed to regard the Marsh test in some form or other as far superior to the Reinsch. It is used generally in two modifications—namely, the Gutzeit and the Marsh-Berzelius. Of the former, I have no practical experience, but it depends on the fact that when hydrogen mixed with arsine impinges on paper containing a metallic salt, such as silver nitrate, a more or less deeply coloured stain is produced. The Marsh-Berzelius test is readily employed and also reliable if carried out under strict conditions as to purity of re-agents (freedom from arsenic) and the performance of a blank experiment lasting some fifteen minutes. The best granulated

zinc (not zinc in rods) and the purest hydrochloric acid or sulphuric acid should be used. Some chemists prefer the former, but I think it is immaterial so long as the acid is absolutely arsenic free. For beer testing, the following apparatus is most suitable:—Take a flask holding about 250 c.c., fitted with a cork doubly bored. Through one hole of the cork passes the stem of a tapped funnel; through the other hole passes a glass exit tube, which is connected with a tube holding a long scroll of dry lead acetate paper, a plug of cotton wool, then three inches of granulated calcium chloride, and finally another plug of cotton wool. This tube is further joined to a hard-glass tube of the size of a quill, the end of which is drawn out finally and bent upwards.

From zinc and acid placed in the flask, hydrogen is allowed to evolve till all air is driven out; the hydrogen issuing from the end of the tube is then ignited. Heat from a Bunsen flame may now be applied to the hard-glass tube at the commencement of the constriction and maintained for fifteen minutes as a blank experiment, and if no arsenic is yielded by the zinc, acid, or any part of the flask and its fittings, the tube will remain clean. If arsenic be so yielded, mirrors will be deposited in the heated hard-glass tube. The blank experiment being satisfactory, 10 c.c. of the suspected beer are introduced slowly by the funnel, taking care to admit no air. The beer must drop in slowly or frothing may be persistent. The beer need not be concentrated or treated in any way; if frothing is persistent, add a little alcohol. The hydrogen flame is ignited and heat applied to the hard-glass tube as before and inspection made for mirrors. Should mirrors result these must be sealed up in the tubes while still full of hydrogen and preserved in the dark. If such mirrors be examined microscopically they are seen to consist of arborescent heads of elementary arsenic, if crystals of arsenious acid are in it, then air has been admitted, and the test for quantitative purposes is valueless. For quantitative estimations a set of mirrors prepared in the above manner for exact amounts of arsenic must be kept in hand for comparison. As a rule, mirrors need not be kept from more than 0·01 mgm. of arsenious acid, as they are too dense to allow exact comparisons to be made. Having stock mirrors from definite quantities of arsenic, it is quite easy to determine from the mirrors yielded by any given volume of beer, how many grains the incriminated liquor contains per gallon. It is important to be able to identify the mirrors as being really due to arsenic; this is best done by taking the tube away from the apparatus and then removing the hydrogen by suction. Close off by fusion from the tube on both sides of the mirror, which becomes now sealed hermetically. Heat a pair of forceps and pass the sealed tube by these gently through a flame until the mirror disappears. This it will do, if arsenic, by being oxidized by the air in the tube into arsenious acid, the glistening crystals of which will be readily seen. The foregoing appears to be the most reliable technique to adopt for the detection of arsenic in malt liquors or in beer sugars.

With regard to the detection of selenium, it is precipitated along with arsenic in Reinsch's test and may be mistaken for arsenic before sublimation. By Gutzeit's and Marsh's test it is not shown at all, being precipitated by the zinc and acid. For the detection of selenium in sulphuric acid there are two delicate tests. The one, based on the production of a steel blue colour with codeine or morphine, is capable of detecting 1 in 200 of acid, whilst the second, consisting in the precipitation of red selenium by passing a current of sulphur dioxide into the diluted acid, may detect 1 in 10,000. If the selenium is present as selenic instead of selenious acid, the first test is inapplicable and the second is obtained with difficulty.

The Etiology of Yellow Fever.—In an interim report to the Liverpool School of Tropical Medicine, Mr. Durham and the late Mr. Myers state that sufficient search reveals the presence of a fine small bacillus in the organs of all fatal cases of yellow fever. They have found it in each of 14 cadavers examined for the purpose. The bacillus is about 4 micro-millimeters in length, and has been found in the kidneys, spleen and various lymphatic glands. The same bacillus is found in large numbers in the intestinal contents, and the mucus from stools of the yellow fever sick presents the appearance almost of a pure culture of the bacillus. It is probable that the same organism has been met with by other workers, notably Sternberg, but its

recognition is difficult owing to the reluctance which it shows to staining with methylene blue and other common stains, and also to the difficulty of establishing growths on artificial media.

Owing to the minuteness and comparative paucity of these bacilli in tissues, Durham and Myers recommend the adoption of a method of sedimentation. A considerable quantity of tissue juice is emulsified with antiseptic solution, minute precautions being taken against contamination; the emulsion is well shaken from time to time and then allowed to settle. The best fluid for this purpose they find to be normal saline with about 0·5 per cent of sublimate. Pure growths are not obtained in ordinary aerobic and anaerobic tubes. They can be secured by cutting out whole glands or tissues by mean of the thermo-cautery and placing the mass into broth under a strict hydrogen atmosphere. The most successful staining reagent they find to be Ziehl's carbol fuchsin solution diluted with 5 per cent. phenol solution. This antiseptic is necessary to prevent accidental contamination during the long staining period of several hours, in some cases two hours staining fails to reveal bacilli which are obvious after some 16 hours staining. "The bacilli in the stools are often of greater length than are those in the tissues, and they may stain rather more easily; naturally the same is true of cultures."

Much search has been made for parasites of the nature of protozoa. Durham and Myers conclude that yellow fever is not due to this class of parasite, having made examinations on very fresh organ juice, blood, &c., taken at various stages of the disease, with and without centrifugalization.

Imperfect as the available facts are, I am disposed to regard this evidence of Durham and Myers, who are known to be careful workers, in favour of the etiological importance of their small and fine bacillus to be stronger than any ever adduced for other alleged yellow fever germs. "At the same time," as they themselves say, "there is much further work to be done ere its final establishment can be claimed."

The endeavour to prove a man-to-man transference of yellow fever by means of gnats or mosquitoes has received much attention from a recent American Commission to Cuba. Some of their experiments included the biting of certain non-immune persons by mosquitoes (*Culex fasciatus*) which had fed on severe cases of yellow fever. Of seven non-immunes bitten by contaminated mosquitoes six contracted the disease. Other experiments were directed to test the validity of the theory that yellow fever is conveyed by fomites, by causing certain non-immunes to sleep in rooms used as stores for infected clothing, bedding, &c. Of seven non-immunes exposed to infection by means of fomites, not one contracted the disease. Experiments were also made on the direct transference of yellow fever by means of the blood of individuals suffering from the disease. Three out of four persons who received injections of from 0·5 to 2 c.c. of yellow fever blood contracted the disease. It would seem, therefore, that yellow fever, like malaria, may be conveyed either by the bite of a particular mosquito or by the direct injection of the blood taken from the general circulation of a patient suffering from the disease. Some of these results are sufficiently positive to suggest that perhaps we are on the point of solving this much debated question of the etiology of yellow fever; but before we can accept them absolutely, we need confirmation and fuller details in respect of some facts.

The Etiology of Tropical Dysentery.—To anyone having experience of the dysenteries from different parts of the world, the expression "dysentery" indicates merely a group of symptoms characteristic of an inflammation of the colon; and suggests that as there are many kinds of dermatitis, each attributable to a different and specific cause, so there are many forms of colitis, each acknowledging a different origin, having a different clinical history, and offering a different prognosis. In this light, the intractable and deadly dysentery of English asylums is a different disease from the comparatively curable dysentery of India; so too the dysentery of the South Pacific was distinct from that of Manilla, or from the relapsing or amœbic dysentery of American writers. In respect of the etiology of these various dysenteries, the student, after labouring through an enormous literature, would be compelled to conclude that no bacterial species yet

described as the cause of dysentery has an especial claim to be regarded as the chief micro-organism concerned with the disease. This attitude, at least so far as concerns what may be termed "tropical dysentery," is now capable of modification by virtue of some recent work by Simon Flexner of Philadelphia, and Shiga of Tokio, who have critically examined cases of dysentery from Puerto Rico, the Philippine Islands and Japan.

In endeavouring to show that any suspected organism is really the causative agent of a disease, it should be proved (1) that the organism occurs constantly; (2) that it is a species not normal to the diseased parts; (3) that it produces in animals lesions similar to those from which it was obtained; (4) it should respond to blood sera of those who have suffered from the disease. In making a bacteriological study of Japanese dysentery, Shiga obtained from the dejecta, intestinal walls and mesenteric glands, a bacillus which fulfilled all these requirements, and which he regards as the cause at least of Japanese dysentery. Flexner, studying the bacterial flora of acute and chronic cases of dysentery in Manilla, and the Philippines, has found practically an organism identical with that of Shiga, and presenting the following cultural properties.

"Bacillus of average size, variable in length, sometimes in pairs, rarely in filaments. Ends slightly rounded; slightly motile. Does not stain with Gram. On gelatine, its colonies resemble those of *B. typhosus*. On potato, the growth is a little elevated and of a pale brown tint. Lactos-eagar is not fermented; in glucose media, a moderate acid production takes place. In litmus milk, a very faint lilac reaction appears at first. It is discernible after 24 hours, but more marked at the end of 48 or 72 hours. After a lapse of 6 to 8 days, alkali begins to be produced, which increases in amount until the litmus is rendered a deep blue. No coagulation of the milk ensues. Indol was variably produced. When tested for its agglutinative properties with the blood serum of persons suffering from dysentery, whether the host or another individual, gave a positive reaction." The dilutions employed are not given by Flexner.

The pathogenicity of the bacillus was studied upon mice, monkeys and various animals. Mice, monkeys, guinea pigs and rabbits were all susceptible to subcutaneous injections. The chief lesions were local œdema at point of inoculation, diarrhœa, with hyperæmia and general inflammation of the intestinal mucosa. Cats and dogs when fed with cultures suffered from enteritis, but without ulceration.

Whether we have here a final answer as to what is the causative agent in tropical dysentery, or at least in types met with in certain parts of the tropics, cannot be decided straight off. But one is fain to admit that these results of Shiga and Flexner are suggestive of an affirmative opinion, or at least that the acute and infectious varieties are of bacillary origin. It is obvious that the bacillus described is one belonging to the colon group, and in its cultural reactions reminds one forcibly of the *B. enteriditis* of Gärtner, usually associated with certain obscure intoxications following the ingestion of unsound meats. Kruse and Pasquale's bacteriological studies of Egyptian dysenteries contain numerous references to bacteria of this family group. Even if we admit that acute and infective varities of dysentery are dependent upon these bacilli, we must still regard the chronic forms of the disease as being dependent upon at least two sets of causes, the first representing a continuation of the acute disease, and probably due to the same micro-organism; the second being due to a different organism, the amœba coli. The acute cases only give sera reactions with Shiga and Flexner's bacillus.

The Prevention of Tuberculosis.—This problem has for some years been an international question, and characterised by an almost unanimous opinion that no matter what preventive measures were elaborated, they must, to be successful, be based on the belief that tubercular infection was transmitted in two main ways—(1) by inhalation of dust containing tubercle bacilli; and (2) by the ingestion of foodstuffs, especially milk and flesh coming from infected animals. Since the delivery, before the British Congress on Tuberculosis in July, 1901, of the remarkable address by Dr. Koch, the situation has materially changed. In that address, Koch admitted his belief in the first named channel of infection, but he dealt a staggering blow to

faith in the second by the statement, "though the important question whether man is susceptible to bovine tuberculosis at all is not yet absolutely decided, and will not admit of absolute decision to-day or to-morrow, one is nevertheless already at liberty to say that, if such a susceptibility really exists, the infection of human beings is but a very rare occurrence. I should estimate the extent of infection by the milk and flesh of tuberculous cattle and the butter made of their milk as hardly greater than that of hereditary transmission, and I therefore do not deem it advisable to take any measures against it."

In support of that statement, Koch brought forward much evidence, which, summarily stated, was as follows. Two series of young cattle were taken and after testing with tuberculin were deemed to be free from tubercle. The members of one series were inoculated with, and made to inspire, bovine tubercle, those of the other series were infected with tubercle of human origin. The first series were attacked by tuberculosis and the second remained free. Similarly, an analogous experiment was made with two series of swine, and almost identical results were obtained. Asses, sheep and goats, into the vascular system of which the two kinds of bacillus were injected, behaved in the same manner as bovines.

These statements and evidence have naturally startled the scientific world, and though as yet accepted by no one, clearly call for a complete re-opening and re-examination of the whole case, which stands somewhat in this way. Koch bases his conclusions, in the first place, on a series of experiments by which he has apparently satisfactorily established that human tuberculosis cannot be transmitted to cattle. He argues, therefore, that human and bovine tuberculosis are specifically different, and he reaches the converse conclusion that man is insusceptible, or practically so, to bovine tuberculosis. It is evident, however, that the evidence on which this conclusion rests is of a very different order from that which led to his primary conclusion. Because experiment has established that cattle are not susceptible to infection from man, the converse proposition does not necessarily hold good. Unfortunately experiment in this respect is out of the question. Koch supports his hypothesis by the argument that if infection by milk were as common as is supposed in the case of infants, we should meet with numerous cases of tubercular disease in the intestine or bowel, that is to say, in the seat of the digestive processes. He asserts that such cases are extremely rare, and cites statistics from the Berlin Charité Hospital and other hospitals to show the rarity of intestinal tubercle in children apart from pulmonary and bronchial tubercle, inferring therefrom that all such cases are explicable by the view that human tubercle bacilli are swallowed as well as inhaled. This raises a very clear issue, and it was remarkable to note that several speakers at the Congress stated emphatically that on this last point Koch's views were not supported by the facts. Thus Professor McFadyean cited the authority of Dr. Still, of the Hospital for Sick Children in London, that in over 29 per cent. of cases in children the primary infection appeared to have occurred through the digestive organs, and also quoted Dr. Sherman that in Edinburgh over 28 per cent. of cases of tuberculosis in children were due to a similar sequence of events. Similarly, Dr. Ravenel, of Philadelphia, in a remarkably philosophical and scientific address mentioned several cases of which he had had personal experience, in which he was satisfied that bovine tuberculosis had been directly transmitted to the human subject.

The question raised is clearly no simple one, and involves an exhaustive inquiry into at least two other obscure points: namely (1) is it possible that mixed infection may play a part in determining an attack of tuberculosis? and (2) may there not be more than one variety of bovine tuberculosis, and may not the human tubercle bacilli be able to affect some breeds of cattle and not others?

As regards (1) we can argue from analogy and recall the fact that under certain conditions the tetanus bacillus is incapable of inducing an attack, while under others it is most toxic. So too, the erysipelas coccus may be greatly increased in activity by the presence of a comparatively inert organism, as the *Bacillus prodigiosus*. We all know that tubercle bacilli may be present in the alimentary canal of healthy individuals without giving rise to tuberculosis; on the other hand, tuberculosis is never present

without the presence of the tubercle bacillus. Is it not of common knowledge that it is specially in children who have some disturbance of the digestive tract that mesenteric tuberculosis is most frequently met with?

In attempting to answer the (2) second question raised, we must not forget that for many years it was believed that splenic fever did not affect the pig, and yet we know now that some breeds may be successfully inoculated with the disease. Surely, this is a point of view which must be considered in the case of the cattle and pigs which serve for experiments with tubercle bacilli. Moreover, as Hueppe has pointed out, Koch's negative experiments are not sufficient to form an opinion whether the kinds of micro-organism are different or identical. On similar data it was once claimed that avian and mammalian tubercle bacilli were different. Their apparent differences were due to modification of media and environment: and experiments by Fischer, Nocard and Hueppe have shown that avian bacilli can be grafted on to mammals and mammalian bacilli on to hens. Yet Koch, by virtue of a small number of negative experiments, wishes the whole world to believe that human and bovine tubercle bacilli, which (both being mammalian) stand nearer to each other culturally than avian and mammalian do, are totally distinct, simply because they do not attach themselves in his animal experiments. Hueppe points out that although it is difficult to alter the differences between avian and mammalian tubercle bacilli it is quite the reverse with the various kinds of mammalian tuberculosis. He maintains that in mammalia a complete equalising of any original slight differences between varieties of bacilli is secured if the causal organisms are identical in kind. In this sense, a natural infection with the tubercle bacillus takes place when it, in a suitable condition, meets a susceptible individual of a susceptible race. He further believes that bovine tubercular bacilli can affect man, and suggests that possibly the pig may be the intermediate host. In respect of this it is more than curious that in some places the question has already arisen whether the increased prevalence of porcine tuberculosis may not be a consequence of pigs consuming waste portions of milk.

Setting aside these questions of possible transmission of tuberculosis from animals, it is still incumbent upon sanitarians to combat this infection through other channels. The whole work of the recent Congress showed how closely dissemination of tubercle infection was identified with indiscriminate expectoration and with the housing of the poor question. The necessity of educating the people on the infective character of tuberculosis, and on the means by which it can be prevented, the need for notification, either compulsory or voluntary, with a greater provision of open air sanatoria, are all matters requiring immediate action if any real progress is to be made towards prevention. So far as being able to set at rest the doubts and difficulties raised by Koch's epoch-marking address, we must await the inquiries and report of a Royal Commission upon the subject which has been appointed. The scope of their inquiry is sufficiently wide, as represented in the following questions to be answered. 1. Is the disease in animals and man one and the same? 2. Can animals and man be reciprocally infected with it? 3. Under what conditions, if at all, does the transmission of the disease from animals to man take place, and what are the circumstances favourable to such transmission. In the meantime, there must be no relaxation of effort to check the spread of tuberculosis, in the light of accepted views. To this end, the Local Government Board issued a circular in September impressing upon local authorities that, pending the report of the Royal Commission, there should be no relaxation in the taking of proper measures for dealing with milk from tuberculous cows, and with tuberculous meat which may be intended for the food of man. Not only does the Board rely on the local authorities to continue the measures hitherto in force, but the opportunity is taken to repeat the main points in the regulations for meat inspectors with reference to the seizure of tuberculous meat, and to point out the desirability of reminding inspectors of their duty in relation to the inspection and seizure of such meat.

The Pathology and Etiology of Pseudo-tuberculosis.—A very interesting account of an inquiry by Dr. Klein into this subject is contained in the Report of the Medical Officer of the Local Government Board for 1899-1900. The term pseudo-tuberculosis, which was formerly used loosely, is

here employed in the restricted sense to denote a single disease which pathologically allied to tuberculosis affects some of the lower animals, and which is transmissible from animal to animal and caused by a bacillus distinct from that which produces human tuberculosis. Klein finds the distribution of the bacillus somewhat wide, for he has detected it in unfiltered Lea and Thames water, in sewage and in milk. In guinea-pigs, subcutaneous inoculation results in a local nodule with neighbouring lymphatic enlargement. In the rabbit the disease is similar, but in the mouse it takes the form of a septicæmia. Microscopically the nodules consist of a round-cell infiltration, but are distinguishable from true tuberculous nodules by an absence of giant cells and of true tubercle bacilli. In the glands and nodules, the bacilli are chiefly in the leucocytes. They are best stained in film specimens by Löffler's methyl blue, and also well shown by Gram's stain. The cultures closely resemble *Bacillus coli*, but present the characteristic of not producing acid in broth. From gelatine cultures, the normal length of the bacillus is 1·2 to 2 μ. Experiments on protection from the disease indicate that guinea-pigs which had received and recovered from a sub-lethal injection were protected against an ordinarily fatal dose. Previous inoculation with tubercle did not affect the course of a subsequently induced pseudo-tuberculosis, the latter process is much more rapid than the tubercle. If, therefore, an animal be injected with milk containing both organisms, it will die probably within sixteen days of pseudo-tuberculosis without allowing time for true tubercle to develop. A previous pseudo-tuberculosis does not delay the subsequent development of tubercle, but an antecedent injection of attenuated pseudo-tubercle appears to do so. These observations have considerable importance in view of the frequency with which rodents are used for the detection of the ordinary tubercle bacillus.

The Bacteriology of Scarlatina.—Dr. M. H. Gordon has made a further report on this subject to the Local Government Board. It will be recalled that some previous work in this direction had been done by Drs. Klein and Gordon, who became convinced that scarlatina was due to an organism which they named "*Streptococcus scarlatinæ*." Owing to the fact that streptococci are "morphologically and biologically unstable," making their differentiation largely "a matter of personal equation," the main conclusions of Klein and Gordon were not generally accepted. This led to the present inquiry, which was a general study of streptococci, specially directed to find out how differing conditions altered their biological character. The general conclusions at which Gordon arrives are as follows:—"1. *Streptococcus scarlatinæ* or *conglomeratus* is a special pathogenic micro-organism, distinct from *Streptococcus pyogenes* on the one hand, and from *Bacillus diphtheriæ* on the other. 2. It occurs in the mucous secretion on the surface of the tonsil and fauces in scarlet fever, and may persist there in some cases up to a period considerably after the attack. 3. It has not been found in four inflamed non-scarlatinal throats examined for it, but on the contrary other virulent streptococci were present in these cases. 4. It may be present in the nasal discharge of scarlet fever. It has not as yet been detected in the aural discharge of that disease. 5. It penetrates the system and can be obtained in pure culture from a serum effusion occurring as a complication in the course of scarlet fever. 6. It may be present in the blood and tissues in fatal cases of scarlet fever, and may not infrequently be obtained in pure culture from those sources. The characters of *Streptococcus scarlatinæ*, as isolated from the tonsil of a mild but typical case of scarlet fever are apt to undergo modification by passage through a mouse. This modification usually comprises increase of virulence accompanied by diminution of those morphological and cultural characteristics that distinguish the *Streptococcus scarlatinæ* from the *Streptococcus pyogenes*." These results, Dr. Gordon thinks, "strongly support the view that *Streptococcus scarlatinæ* is the specialized and essential agent of the specific infection known as scarlet fever." The characteristics of this micro-organism were given on page 362 of last year's annual report.

The significance of Streptococci and Staplylococci in a Water Supply.—For some investigations on this subject we are indebted to Dr. Houston, whose report is made to the Local Government Board. It is a question of great

interest to all engaged in the bacteriological examination of water, and one which has not escaped attention in our laboratory at Netley. From an examination of fourteen samples of water from various sources, Houston found that streptococci were present in numbers generally proportionate to actual contamination with sewage. Thus, in one sample from a tidal river taken 25 yards below the outfall of a main sewer, streptococci were found in so small a quantity as 0·0001 cubic centimeter, whereas in a sample taken above the outfall none were found. Samples were also taken from the polluted bed of the same river and streptococci found in 0·001 c.c. of the washings. The presence of streptococci in waters, especially polluted waters, has for some time past been recognized as an important indication of contamination with animal organic matter. Houston, in discussing the value of what he calls the "streptococcus test," points out how the presence of the *Bacillus enteriditis sporogenes* is evidence of contamination with excrement, but not necessarily recent contamination; that the presence of *B. coli* indicates recent pollution, while the presence of streptococci implies animal pollution of extremely recent, and therefore specially dangerous kind. In the light of our experiences in the examinations of large numbers of waters and sewage effluents at Netley, these are conclusions to which, in their entirety, I am unable to subscribe. In my opinion, the streptococci are extremely hardy units in the bacterial flora of sewage; their presence in water suggests a recent pollution with probably an old sewage, though not necessarily a dangerous one unless *B. coli* be also present in large numbers. The value of *B. enteriditis sporogenes*, as an index of contamination, has been over-rated, as only in cases of gross pollution can it be isolated.

Soil in relation to the Enteric Fever bacillus.—Soil in its relation to enteric fever has long attracted the attention of several observers. Some of the most careful work has been by Dr. Sidney Martin, who has contributed much useful information on the subject, from time to time, in his Reports to the Local Government Board. In this year's Report of the Medical Officer of the Board, we have details of some further work on this subject from the same source. In his earlier experiments, Martin showed that the *B. typhosus* will grow, multiply and retain its vitality in certain soils when sterilized; when, however, unsterilized soil was used, the bacillus could not be detected in or recovered from the soil later than 24 hours after the addition was made, the normal bacteria of the soil either preventing its detection or causing its disappearance. In order to decide how far these negative results in unsterilized soils were due to excessive moisture and undue temperature (37° C.), the experiments were repeated in drier soils and at a lower temperature (12° C.). It would appear from these later experiments that certain soils, especially garden soils, are favourable when sterilized for the growth of the enteric bacillus, but that in virgin unsterilized soils it rapidly dies. When added to unsterilized dry soils under conditions of low temperature, the bacillus can retain its vitality for quite twelve days. Martin concludes that "as far as is known, the typhoid bacillus has no resting stage. It has no spores, so that, if it once dies, it cannot be expected to reappear unless a fresh inoculation occurs."

In startling contrast to these experiments and conclusion of Martin's are some remarkable experiments, bearing on the same question, by Rullmann ("Centralb. f. Bakteriol.," Bd. xxx, No. 8). These show that after enteric bacilli have been added to variously fouled but sterilized soils, the bacilli can be recovered from such soils after an interval of as much as sixteen months; while when the various soils had not been sterilized, the micro-organiism was recoverable even after a hundred days. Rullman's experiments seem to have been conducted with great care, but from the reactions of the bacilli isolated from the soils it is open to doubt whether in all cases he was dealing with the enteric bacillus; however, the disparity between his results and those of Martin is so great that it is difficult to accept either series as furnishing a satisfactory clue towards understanding the conditions under which natural soil is capable of harbouring the enteric bacillus. The problem still needs further investigation.

The Influence of Fish in the Dissemination of Enteric Fever.—For some years there has been a growing belief among sanitarians as to the possibility and probability of fish in varying forms being concerned in the propagation

of enteric fever. This idea has received considerable support from various reports made from time to time to the Local Government Board. During the past year three important communications have appeared, having direct reference to this subject. The first is a paper by Drs. Headman and Boyce in Vol. II, of the Reports of the Yates-Thompson Laboratories, Liverpool, on "Oysters and Disease," the second is a Report to the Local Government Board by Dr. Klein on "Cockles as Agents of Infectious Disease" appearing in the 29th Report of the Medical Officer to the Board, and the third is a Report to the London County Council by Dr. Hamer "On certain Localized Prevalences of Enteric Fever in London in September, 1900."

In regard to the first named article, although there can be no question that infected oysters may propagate enteric fever, and that the chief source of their contamination is to be sought in the sewage-polluted beds where they fatten and grow, it is interesting to learn from the very exhaustive inquiry made by Drs. Headman and Boyce that the danger is by no means a constant one, and that there is nothing inherent in these bivalves to in any way stimulate the development of specific material when it does gain entrance to them. In the second paper, Dr. Klein shows that, like oysters, cockles are capable of taking into their interior the microbes of sewage, specimens bought in their shells from a street hawker yielding pure cultures of *Bacillus coli* and *Bacillus enteriditis sporogenes*. The risks, therefore, attending the indiscriminate consumption of these shellfish in an unboiled state is very real.

Dr. Hamer's report is a notable one, not only because it is a most painstaking and exact investigation, but also because it implicates an article of food (fried fish) not previously suspected of having any causal concern with enteric fever. Three localized outbreaks of enteric fever occurred in London in September, 1900, namely, in Kensal Town, Lambeth and Southwark. In the last two of these most of the agencies commonly associated with enteric outbreaks, such as milk infection and infection by water or ice-creams, could be positively excluded, while the special age distribution of cases (15 to 20 years) was found to be exceptional. Hamer, in his inquiries as to food, elicited the fact that fried fish purchased from a particular shop seemed to have had a nearly universal attraction for the persons attacked by the disease. Further, that the distribution of affected houses showed a grouping about this shop as a centre, that the intensity of incidence of house attacks rapidly lessened at increasing distances from the shop, and that in several instances it was noted in particular families that it was the fried fish eaters who were attacked, to the exclusion of others not eating fried fish. These facts were sufficiently startling to permit of a provisional hypothesis being made that fried fish was the infective agent. Four difficulties quickly presented themselves as militating against an absolute acceptation of this hypothesis : these were, (1) the temperature to which fish are subjected during frying would be likely to kill any typhoid bacilli ; (2) how could the fish have become infected originally ; (3) the difficulty of the age and sex incidence ; (4) the possibility that everyone in the affected neighbourhood partook of fried fish, and that the consumption of fried fish by the attacked had therefore no special significance.

The third and fourth difficulties raised were overcome in a remarkably satisfactory manner, as observation kept on the incriminated fish shop made it clear that "the ages specially attacked in the Southwark outbreak were the same as those observed to be represented in large proportion among those persons consuming fried fish." Moreover, from inquiries as to what proportion of the total population of the affected area consumed fried fish, it was found that 42 per cent. of the population did not eat fried fish at all, 13 per cent. ate fried fish obtained elsewhere, and 42 per cent. ate fried fish obtained from the special shop. After eliminating 15 cases which were either imported or clearly not associated with the special outbreak, practically 100 per cent. of the cases attacked ate fried fish from the special shop. In considering particular families, the attack of persons who did and the escape of persons who did not eat fried fish was very marked. The first difficulty is a serious one, and on mere *a priori* grounds is sufficient to dismiss from consideration the hypothesis as untenable. But Dr. Hamer

appositely recalls the history of certain cases of cholera in London in 1893, in which the only possible cause detected was that cooked fish, derived before cooking from Grimsby (then a cholera-infected port) had been recently eaten. In the same direction one is at once reminded of the cases of enteric fever which in Brighton, Chichester and other towns have been clearly traced to the eating of cooked mussels and cockles. These molluscs are usually not cooked to the same extent as fish, but their lesser bulk makes the destruction of infective germs in their interior an easier matter with an equal amount of heat than fish. Experimental evidence on these points is not conclusive, and unfortunately in this particular case it was impossible to trace the source of the particular fish further back than Billingsgate Market.

The thermal death-point of the enteric bacillus is less than 60° C., and before considering fried fish as a possible agent in the dissemination of enteric fever, the evidence implicating it needs to be very strong. Taking the whole facts of the case into consideration as put forward in Dr. Hamer's report, one cannot but admit that the evidence adduced in support of the fried fish hypothesis is so far in excess of suggestive as to be almost convincing. Apart from its direct and immediate interest, this outbreak of enteric fever brings into prominence the great difficulties in considering the precise degrees of proof with which one may be satisfied in public health investigations. Our means of investigation are still so imperfect that it is but seldom that actual certainty can be reached, and the daily experiences of every medical officer in these inquiries only too forcibly show that we must be content with probabilities.

Protection from Water-borne Disease.—The excessive prominence which the prevalence of enteric fever amongst our troops in South Africa attained, has directed special attention to some of the methods available for the prevention of water-borne disease. Two principal aspects of this question merit reference as having come into discussion during the past year. I refer to: (1) the protection from water-borne disease afforded by the filters of the bougie or candle type, and (2) to methods for the chemical purification of drinking water. The former subject has been very carefully re-investigated here at Netley by my colleague, Major W. H. Horrocks, R.A.M.C. The experiments were made upon Pasteur-Chamberland and Berkefeld candles, by fitting them into glass mantles and fixing either by indiarubber bungs or winding screws. The delivery pipe in each case was connected by a short piece of indiarubber tubing, fitted with a pinch-cock, to a Kitasato flask. After sterilization, the flask received sterile broth and the whole of the connections were made water-tight with melted paraffin wax. The mantles were then filled with broth so as to completely cover the filtering candle. By opening the pinch-cock 10 c.c. of the broth from the mantle were allowed to filter through the bougie into the flask, under atmospheric pressure. After 48 hours, the broth in the mantle and flask being found to be still sterile, that in the mantle was inoculated with fresh culture of typhoid baccilli and the whole installation placed in an equable temperature of about 25° C. Each day, 10 c.c. of the broth in the mantles was caused to filter through their respective candles into their attached flasks. The passage of any micro-organism through the filters was at once manifest by a resulting turbidity in the receiving flasks. From the experiments, the following conclusions appear justified:—"1. Typhoid bacilli are not able to grow through the walls of a Pasteur-Chamberland candle, and if proper care be taken to prevent the direct passage of the bacilli through flaws in the material or imperfections in the fittings, the Pasteur-Chamberland filter ought to give complete protection from water-borne enteric fever. 2. Typhoid bacilli can grow through the walls of Berkefeld candles, probably owing to the larger lacunar spaces, and the consequently diminished immobilizing and devitalizing influences. The time required for the typhoid bacilli to traverse a candle varies between four and eleven days, and appears to be largely dependent on the nutriment supplied to the organisms by the medium in which they exist. In order to obtain complete protection from water-borne enteric fever, when employing Berkefeld filters, it is necessary to sterilize the candles in boiling water every third day."

These experiments were undoubtedly a very severe test of the bougies or

candles, as these latter were practically continuously immersed in pure cultures of the enteric organism, a condition which must rarely obtain under circumstances of daily use. I have repeated these observations in a modified form, substituting an intermittent immersion of the bougies in a polluted medium for that of continuous immersion. The results show the marked superiority of the Pasteur-Chamberland candle over that of the Berkefeld, and so far as the direct passage of micro-organisms through the media is concerned indicate that under circumstances of intermittent immersion the enteric bacillus will appear through the Berkefeld candle at a minimum interval of six days, the maximum, when working with an absolutely new bougie, being fourteen. The question of dryness appears to be an important factor in this matter, as the longer periods at which the passage of micro-organisms into the filtrate took place were always coincident with a greater drying of the candles between each time of using. The practical outcome of the whole inquiry is but to emphasize the need of properly sterilizing the bougies or candles every three days; this detail was clearly laid down by the War Office in their official instructions for the use of the field service filters, long before these experiments were made.

The feasibility of the chemical purification of drinking water has been frequently discussed, as reference to some former reports on the progress of hygiene will show, wherein allusion has been made to such methods as have been suggested from time to time. In a paper read before the Epidemiological Society, in January, 1901, Drs. Louis Parkes and S. Rideal recommended the use of tabloids of bi-sulphate of soda, stating that "the *Bacillus typhosus* is killed by only five minutes' contact with sodium bi-sulphate in the proportion of one gramme (15·5 grains) per pint of infected water; but, in our opinion, it is better that contact should be made for fifteen minutes in order that sterility may be ensured." This alleged action of the bi-sulphate has been tested by me at Netley, and the experiments show that a contact of fifteen minutes with the bi-sulphate in this strength causes a marked reduction in the number of bacilli present, but certainly does not sterilize water containing *B. typhosus*. Using the salt in proportion of one gramme to a pint of infected water, I find that while a contact of thirty minutes does in a majority of instances destroy *B. typhosus* in tap water, absolute sterility is not always assured with less contact than forty-five minutes. If the water be infected with the vibrio of cholera, then a gramme to a pint is effective after ten minutes, while *B. coli communis* needs an exposure of virtually an hour. For circumstances of urgency, that is when time is an object and a delay of nearly an hour cannot be given for sterilization of water by the bi-sulphate, I find that rapid sterilization is secured of highly polluted water in five minutes if three grammes be added to a pint of liquid, and in fifteen minutes if two grammes be used. These larger quantities of the bi-sulphate render the water markedly acid, and, after sterilization and before it is potable, necessitate the subsequent addition of an alkali to secure neutralization. Tabloids of bi-carbonate of soda naturally suggest themselves for this purpose, and this salt is needed in proportion of 0·2 gramme for each 0·3 gramme of the acid sulphate used.

The action of sodium bi-sulphate obviously depends on its free acid, which, from one tabloid containing 0·3 gramme, is equal to about 15 minims of dilute sulphuric acid.—B.P. Whether the consumption of large quantities of dilute acid in this form would unfavourably affect the digestive and assimilative functions of the consumer is a matter I have not been able to settle, beyond knowing that five grammes consumed in one day by myself was well tolerated: but a daily consumption over any length of time might not be so agreeable. The utility of this method in the circumstances of field service appears to me to be clear. Of course there are difficulties to be overcome, not the least perhaps being the objection of the soldier to consume what he calls "doctored" water. It is possible that recent events in South Africa may have overcome this prejudice among the rank and file; whether such is the case can only be determined by an experimental issue of sodium bi-sulphate on a gigantic scale to troops in the field. In any case, the difficulties attending adequate filtration methods, especially in the field and where the only water available is heavily loaded with suspended matter,

have become so obvious that I cannot help thinking that the time has come when a serious effort to use chemical methods of purification should be made. The markedly destructive action of sodium bi-sulphate on the vibrio of cholera clearly indicates its value in times of epidemic prevalence of that disease.

Another method of chemical purification, with which I have made some experimental observations is one suggested by Lapeyrère in the Military Hygiene subsection of last year's Congress of Medicine at Paris. A powder consisting of permanganate of potash 3 grammes, aluminate of soda or potash 10 grammes, carbonate of soda 9 grammes, and carbonate of lime 3 grammes, is prepared, mixed and added to 100 litres of infected or foul water. After standing for a few minutes, the water is passed through a filter of purified peat fibre mixed with black oxide of manganese packed into a vessel made of some unoxidizable material. My results in respect of mere clarification of dirty waters have been good, but in respect of sterilization very unsatisfactory. Even after allowing the water to stand an hour after addition of the powder, and employing very slow filtration through the manganese, absolute sterility was not secured. The process is evidently somewhat cumbersome and at the same time unreliable. It is much inferior to the bi-sulphate of soda method, and to the bromine method of Schumburg, described in the progress report for 1897.

The Dietetic Needs and Physiological Features of Exaggerated Exercise.—At the end of last year, in connection with some studies regarding a suitable emergent and ordinary ration for soldiers in the field, it appeared to be a matter not only of interest but of practical importance to understand the food requirements of men in good athletic training, that is of men brought into that condition by carefully regulated exercise and dieting and who at the time were performing somewhat severe athletic work. With this object I made some investigations into the precise dietaries and their values of five football players belonging to the Southampton Club, which at that time was occupying a prominent position in certain football competitions. The results of my inquiries showed that the food consumed by these athletes contained a daily average of 142 grammes of proteid, 130 of fat, and 395 of carbohydrate, and affording an average daily energy value of 3,410 calories. The prominent characteristic of such a dietary is the large amount of proteid; its energy value is that of a diet for severe labour, but the proteid is sufficient for more severe labour than that energy. From other inquiries made, it seems that this excess of proteid is a normal feature of most athlete's diet, for taking the extreme case of a man like Sandow, I find that when in training he ate as much as 244 grammes of proteid daily. Atwater has also reported on the dietaries of certain boat crews in training, and shows that in their case the diet contained a daily average of 155 grammes of proteid, 177 of fat, and 450 of carbohydrate; while some American football teams were found to eat on an average 181 and 270 grammes of proteid daily, and some bicycle race riders averaged 169 to 211 grammes of proteid daily. As compared with the Americans, our local athletes would seem to consume a fairly moderate diet, but as compared with soldiers it must be regarded as extraordinarily liberal. The average daily input of soldiers on field service I estimate to be somewhat as follows: Proteids 120 grammes, fats 60 grammes, and carbohydrates 480 grammes, having a total energy value of 3,000 calories, while in conditions of emergency, and when only in receipt of the iron or emergent ration, the daily value of available food is not more than 1·8 gramme proteid, 1·65 gramme fat, and 3·75 grammes of carbohydrate. These disparities have a physiological basis. The work of an athlete differs essentially from labourers' work, in that it is very severe but of short duration. The soldier conforms more to the labourer, and is fed more for sustained exertion. While it may be taken that the essential for an athlete or football player is to have a very ample energy-liberating mechanism (muscle), capable of rapidly converting all available energy-producing material (food) into work; on the other hand, the essential for the soldier or actively-worked labourer is not so much a highly developed liberating mechanism as a large store of energy-producing material. It is common knowledge that athletes are not good labourers, and that labourers are not good athletes; the

diet and training of the two classes are essentially different. The low values of the soldier's emergency diet are due to obvious needs for reconciling volume and weight of food carried with a maximum of potential, but without special reference to the maintenance of nitrogen equilibrium, as such a diet is only used for short periods. Material advancement in this class of ration is being made, by the greater use of some concentrated and artificial food stuffs, such as plasmon and tropon, which are proteids derived from milk, fish, and some cereals, and which yield from small bulk a large ratio of energy-producing matter.

Respecting the metabolism characteristic of certain forms of exaggerated exercise, some very interesting work has been done in Germany by Zuntz and Schumburg, whose work on the physiology of marching is reviewed elsewhere in this progress report. They carried out their research on five students of the Military Medical Academy in Berlin, who were set to march in uniform, carrying the usual military accoutrements. Their main results and conclusions may be thus summarized: Severe marching lengthened cardiac systole, shortened diastole, and increased dicrotism. The prolongation of systole must be regarded as a sign of cardiac fatigue, it being lengthened 55 per cent. by a load of 68 lbs., and 30 per cent. by a load of 40 lbs. The pulse was increased, and prolongation of systole was accompanied by cardiac dilatation and hepatic congestion. The left side of the heart was dilated as well as the right. This venous congestion and consequent enlargement seemed to be chiefly due to fatigue of the respiratory pump supplemented by cardiac fatigue. In cases where too heavy a load impeded respiration, it became shallow and frequent; the vital capacity also was much reduced, especially in the younger men. Zuntz and Schumburg lay down the rule that after a quarter of an hour's rest the frequency of respiration should not be more than 30 per cent. over the normal, and during actual marching not more than 75 per cent.

Some observations on temperature showed that with a load of 46 lbs., and marching 15 miles in a tropical heat, it did not rise above normal. A march of 20 miles carrying 68 lbs. caused a rise from 1° to 1°·5 C. of body heat, the same being in one case raised to 105° F. when a corresponding march was made after a previous night of debauch. Concurrent with these exercises in marching, a temporary concentration of the blood occurs; this is not due to sweating alone, as this loss of water is counteracted by a withdrawal of tissue lymph into the circulation. It seems, however, that marching produces no permanent effects on the blood of a healthy man.

The analyses of the urine in these cases are instructive. Owing to sweating and diuresis there was an increase of gravity, and after short muscular efforts albumen and casts were observed, but never after mere severe marching. There was no increased output of ammonia, but phosphoric acid and calcium were lost in amounts out of proportion to the nitrogen. The increased output of this last named due to marching accounts for 7 per cent. of the total energy expended, and in very hot weather exceeded that. The authors calculate that as much as 12 per cent. of the nitrogen given off in the urine and fæces may be lost in the sweat during hard work, and increased nitrogen output in sweat is dependent more on temperature of the air than on load carried. For every 1,000 calories of energy expended in marching, it is reckoned that 800 grammes of water are evaporated. The following figures are interesting: A man 154 lbs. produces when resting 1·3 calories a minute, but while marching with a load of 68 lbs. he produces 7·7 calories a minute. This extra production of heat is calculated to raise the body temperature 1°·8 F. in 8·5 minutes, but is neutralized by the heat-regulating mechanism of the body, in spite of uniform and accoutrements. A heavy load increases sweating by impeding pulmonary ventilation. Zuntz and Schumburg are of opinion that the sweat glands are the main heat-regulating factor, and that men with hot, dry, dark red skins, and torpid or inactive sweat glands are especially in danger of heat-stroke. Most medical officers are familiar with this type of man.

It is needless to say, perhaps, that the authors dwell on the importance of substituting light, porous clothing for the heavy and close woven materials which constitute some uniforms. They conclude that there is

no danger in long marches in very hot weather if the men be [illegible] the load should not exceed 48 lbs. These researches, of which I have [illegible] given an essential summary, are of the greatest [illegible] the military surgeon, and, though not really establishing any new principle not known to or not animating the sanitary supervision of the Roman [illegible] other, is still well worth studying in their original form in the [illegible] elsewhere reviewed.

The Relationship of Vaccinia to Small-pox in Man.—The difficulty experienced in attempts to transmit human small-pox to bovines has frequently been quoted as a reason for distrusting the theory first put forward by Jenner, that cow-pox was originally derived from small-pox in man. In a recent communication, Dr. S. M. Copeman has established facts which go far to remove the difficulty above mentioned. Acquainted with the idea that, not improbably, it was from the inoculated form of small-pox rather than the idiopathic or ordinary variety that much of the cow-pox in Jenner's day was derived, Copeman, in default of getting a case of inoculated small-pox in the human subject, made a trial of the monkey, which is readily susceptible to the disease, and in which the various phases resemble closely those observed in man. In each of three separate series of experiments, human small-pox lymph or pulp, secured primarily from cases coming under observation during outbreaks in Glasgow, was inoculated directly on calves, and in every instance with negative results. When, however, the small-pox material was inoculated on to monkeys, success invariably obtained. After one or more passages through this animal, the contents of the local inoculation vesicles were employed for insertion on the calf, and an effect produced which, after one or more removes in that animal, was indistinguishable from typical vaccinia. Moreover, from the contents of these vesicles on a calf, a number of children were in turn vaccinated. Every such vaccination "took" normally, and quite without any bad result.

These experiments have a noteworthy interest in demonstrating that whereas human small-pox material could not be got "to take" directly on to the calf, nevertheless results typical of ordinary vaccinia were obtained when the strain of lymph, after passage through the monkey, was transferred from the inoculation vesicles on that animal to the calf.

The Causal Element of Vaccinia and Variola.—For some advance in our knowledge respecting this question we are indebted to Funck (*Deutsche Med. Wochsch.*, Leipzig, 1901, Bd. XXVII, S. 130), who maintains that vaccinia is not a bacterial disease but a protozoal infection, and that the organism can be seen easily in both active lymph and vaccinal pustules. Also that the inoculation of these parasites causes vaccinia in all animals, and that this inoculation confers immunity against further inoculation of vaccine. The protozoon, which he finds in vaccinia, is morphologically similar to that found in variolous pustules. The result of Funck's experiments show that variola and vaccinia are identical affections, that vaccinia is a milder form of variola, and hence the anti-small-pox immunity, which is produced by vaccination, comes under the general laws of specific immunity. The characteristic elements which Funck finds in fresh lymph appear to be identical with those described originally by Pfeiffer, and are large egg-shaped, non-staining cells, occurring in linear masses in old lymphs and as single motile forms in fresh lymphs. Funck suggests the name of "*Sporozoum vaccinale*" for the organism, which, after separation from the lymph and successive washings in bouillon, he has inoculated into calves, producing typical pustules on the sixth day and conferring on the animal a typical immunity.

These inoculation experiments are as important as they are interesting, and if verified by other observers, will go far towards explaining much that has been difficult to understand. Meanwhile, further reports and developments will be awaited with interest.

Some German Sewage Disposal Experiments.—The supplements to the last two "Vierteljahrschrift f. gerichtl. Medicin und öffentliches Sanitätswesen" ("Quarterly Journal of Forensic Medicine and Hygiene") contain accounts of some experiments on sewage disposal which are worthy of note. The experiments have been carried out in various places by sanitary officials

and engineers, and though spoken of under German names the processes are clearly of British origin. Thus, the closed septic tank is known as Schweder's, quite regardless of Cameron's primal association with the method. The Germans appear to have made some variations in mechanical details, but none of principle. The actual systems tried are (1) contact beds, (2) closed septic tanks, and (3) lignite-paste process.

The German contact bed experiments have been tried at Hamburg and Charlottenburg, near Berlin. In size, the beds are much smaller than exist in many English towns, but the interest of the experiments lies in the fact that the sewage treated at Hamburg was only domestic, while that at Charlottenburg was both domestic and trade. The Hamburg contact beds were covered, and received purely domestic sewage, which was screened, but as it came but a very short distance, the solids were not much broken up. The material used was coke, yet with double filtration the best purification secured was only 85 per cent. reduction of oxygen absorbed, whereas in England we have obtained, when working with a really stronger sewage, a purification amounting to 94 per cent. The general conclusions drawn here are much the same as those of English observers. At Charlottenburg, where a screened domestic and trade sewage was worked upon, experiments were made with coke and sand, gravel and sand, and sand with brick breeze. The opinions formed are that coke is the best medium using a two hour contact period; also that aeration is necessary, and that cold (— 10° C.) does not interfere with the action of the beds. A further remarkable conclusion is that the reduction in the number of bacteria is of no appreciable extent, hence the effluents, if they are to enter streams, require similar precautions and treatment as mere settled sewage.

The closed sewage tank experiments were made at Lichterfelde, near Berlin, and the effluent run on to a single contact bed of coke. The results obtained do not differ materially from those obtained elsewhere, but it is noticeable that the total solids increased rather than diminished; no statement is made as to any change in quantity of solids in suspension. We certainly have obtained better results in England, but these experiments confirm our own views that, except to avoid smell, the closed sewage tank presents no advantage over the open.

Experiments with what is called the lignite-paste process took place at Potsdam and Tegel. The patent is called the Rothe-Degener. The sewage is first mixed with crushed lignite, and then precipitated with ferric sulphate; the sludge settles and the clearer liquid is pumped up into a tower, where after the addition of 15 per cent. of bleaching powder it is run off into a river. The sludge is drawn off, pressed, and then used as fuel in the boiler furnace. The amounts of lignite and ferric sulphate used are 1 kilogramme of former, and 170 grammes of the latter to each cubic metre of sewage. The results obtained are remarkable, as practically a sterile effluent is yielded and no difficulty experienced in disposing of the sludge. The cost per head is high, working out at about 1*s.* 3*d.* Possibly, with better mechanical arrangements and further simplifications, it might be made more economical. The main objection to this process appears to me to be that although it yields a sterile effluent it is one containing much free chlorine. This, in the German case, does not raise a practical difficulty, as by running the chlorine-containing effluent straight into the River Havel, no harm was done to the fauna and flora of the stream, nor was the total amount of chlorides in the stream sensibly affected. It is questionable whether such could ever be done in this country, where the rivers are much smaller than those of Germany, and where a minimum dilution of 1 in 1,000 is not readily obtained. The only way would be to run such a chlorine-containing effluent through a shallow bed of coke or gravel, which, though it would remove the free chlorine, must necessarily also remove sterility. The mere addition of micro-organisms, so long as they are not pathogenic, would not be a vital objection.

The Survival of Pathogenic Organisms during Sewage Purification processes.—We know now, sufficiently well, that, both on a large and small scale, bacterial treatment is more effective and economical than the older methods: but the question arises, is it possible to eliminate all pathogenic bacteria from sewage by these methods? The answer to this is mainly, what

are the chances of survival of such an organism as the *Bacillus typhosus* during processes of sewage purification? Much work has been done upon this obscure and complicated problem by studying the life history of the enteric bacillus and other varieties of bacteria associated and comparable with it in sewage, both before and after purification. Our experience at Netley, so far, indicates that the enteric organism can survive in *sterile* sewage for at least sixty days, and that the chemical ingredients of sewage alone do not destroy it before discharging into stream or river, and that some of the bacteria commonly present in sewage produce little or no effect upon this pathogenic bacillus. But we are still unable to give a precise answer to the question whether the *B. typhosus* can survive in *crude* sewage until such time as it is discharged, or whether it is likely to live through any of the usual methods of purification. The nearest approach to a solution of this problem is afforded by Houston's experiments on the crude sewage of London and on the effluents from contact beds at Barking. Recognizing the chance of detecting *B. typhosus* in sewage to be "so remote as to be almost infinitesimal," he worked with two organisms, usually abundant in excremental matter and presenting certain definite characters, namely, *B. coli* and *B. enteriditis sporogenes*. By isolating and counting the numbers of these, both in the crude sewage and in samples of the corresponding effluents from the bacteria beds, he arrived at the conclusion that though the number of *B. coli*, and the number of spores of *B. enteriditis sporogenes* was, on an average, less in the effluents from the coke beds than in the raw sewage, the reduction was not well marked, and frequently the number was actually greater in the effluents than in the corresponding samples of crude sewage.

Admitting that *B. typhosus* is a less hardy organism than either *B. coli* or *B. enteriditis sporogenes*, it is unsafe yet to assume from these results that the *B. typhosus* would be destroyed by the action of these bacterial beds. The only drawback to Houston's experiments seems to me to be that they were made on effluents from single beds; and we have evidence from other sources that the numbers of *B. coli* may be very considerably reduced if an effluent from a first contact bed be passed through a second bed. In fact, Rideal reports a reduction of as much as 97 per cent. by the nitrifying trays of the Scott-Moncrieff installation at Caterham, while Miss Chick of Liverpool in a recent report of the Yates-Thompson Laboratories: Vol. III, Part I, 1900, states that by passage through double contact beds a reduction of 75 per cent. of *coli* organisms can be secured. These are suggestive but inconclusive results, and the only deduction we are at present justified in drawing is that the prevalent idea that the pathogenic bacteria of sewage are destroyed in various processes of sewage purification is based upon inadequate proof; and that, on the contrary, the evidence tends to show that the pathogenic bacteria of sewage are not necessarily destroyed by the processes which take place in bacterial single contact beds.

The Official Work of the year in the Netley Laboratory.—In general scope and amount, the official work done in the Hygiene Laboratory, at Netley, during the period September 30th, 1900 to September 30th, 1901, resembles that of previous years. What its nature has been, will be evident from the following list of articles analyzed and reported upon during the period under review.

	Samples.
Water	108
Sewage effluents	36
Milk	15
Condensed milk	18
Malted liquors	74
Meat extracts or essences	18
Lime juice	5
Bread	1
Flour	1
Joint of preserved meat	1
"Solid Ale" food	1
Marvis, fish food	1
"Nurrah" food	1

"Tropon" foods	2
"Pure egg"	6
Cocoa paste	2
Biscuits	2
Emergency rations	4
Tinned meat	1
Sardines	1
Concentrated soups	7
Bloater paste	1
Casein	1
Pepper	1
Oats	1
Liquid egg	2
Butter	2
Jams	2
Bran	1
Soap	4
Anti-typhoid tablets	3
Stomach washings	1
Filters	3
Khaki clothing	1
Soiled sheeting	1
Total	329

Some of the foregoing samples deserve a brief notice. The water samples have come from all parts of the Kingdom, and 26 were reported as being unfit for drinking purposes. In the majority of cases, a bacteriological as well as a chemical examination has been made. The difficulties in the way of isolating pathogenic micro-organisms, especially that of enteric fever, from water, even when strong presumptive evidence exists that it is present, are still great. We are constantly trying new techniques, but find that a modified Parietti method, either on a concentrated (filtration through Pasteur-Chamberland bougie) or non-concentrated water, gives sufficiently good results for detecting micro-organisms of the typho-coli group. The anaerobic use of formate broth we have not relied upon so much as formerly, owing to a distrust of its always permitting of a growth of the enteric bacillus. In no sample of water has the *B. typhosus* been detected, though many have yielded large numbers of *B. coli* and its varieties.

The large number of malt liquor samples sent down for analysis was due to the arsenic scare of last winter. This subject I have discussed elsewhere in this report.

The sewage effluents submitted for analysis have afforded some interesting facts. They all have been from bacterial installations. A remarkably good effluent reached us from Crownhill, Devonport. This yielded the following analysis, expressed in parts per 100,000:—Solids in suspension, *nil*; Solids in solution 97·00; Chlorine 12·80; Free ammonia 0·36; Albuminoid ammonia 0·098; Nitrous acid 0·46; Nitric acid 4·12; Oxygen absorbed 0·375. Mr. Tyndale of the War Office tells me that this sewage from the barracks is not treated by a bacterial installation in the ordinary acceptation of the term, but is treated by filtration through a series of terraces composed of loose shale without any preliminary treatment other than screening. It is obviously subjected to bacterial action in the soil, and is an illustration of how, given suitable soil and gradients, excellent results can be obtained from a really simple installation. Less satisfactory effluents have been received from the neighbourhood of Aldershot, owing to the excessive amounts of urine (mainly equine) admitted into certain septic tanks. These adverse results have been largely due to the absence of solid excreta, and with it a want of the necessary micro-organisms to bring about the essential changes. These, however, do not strictly represent samples from ordinary sewage treated on biological principles, but illustrate the need of the solid elements of excreta in a septic tank, and that dilute urine is incapable alone, after passage through a closed tank and then through a filter bed, of being resolved into a passable effluent.

In respect of standards for sewage effluents, I am more and more convinced that our present means of analysis do not warrant the fixing of any arbitrary chemical standard. In forming an opinion of effluents, we must judge each in regard to the nature of the sewage from which it has been derived, also consider the conditions, extent and uses of the stream or land which is to finally receive it. If standards are asked for, then the least that should be expected from all effluents is, the presence of little or no suspended matter (say 5 parts per 100,000), an absence of odour, and stability as evidenced by no retrograde changes after incubation for four days at 37° C. Our experience at Netley goes further to show that if nitrates are present after incubation at 37° C. for two or three days, such an effluent will remain inoffensive, no matter what its original chemical composition in terms of ammonia may have been. From what I have already said in preceding pages of this report, the precise value to be placed upon the bacterial constituents of sewage effluents is a subject on which a final opinion cannot yet be given.

The various samples of milk, condensed milk, meat extracts, meat essences, bread and flour which has come under notice call for no special remarks. The joint of preserved meat which came for report had a French origin and had evidently been treated by immersion in some antiseptic medium; it was not found to be satisfactory. The food stuff called "solid ale" was a compressed glucose preparation of no particular merit. Many of the other foodstuffs were of value and have been taken into consideration as possible means of entering into the composition of emergency rations. The materials which appear to be best suited for this class of issue are chocolate pastes, containing either plasmon or casein and various "tropon" meals yielding high percentages of proteid. The various other articles sent for analysis or examination do not permit of special reference in this place.

III.—*Literature.*

A number of new books, reports and papers have been added to the literature of public health and sanitary science during the year under review. The following is a brief summary of the more important which have come under my notice.

Report of the Royal Commission on Sewage Disposal. London: Eyre and Spottiswoode, 1901.

Although but an interim report, few pronouncements have been more eagerly awaited by sanitarians than this parliamentary paper. The Commissioners state that they had examined a large number of witnesses and visited many sewage works of various kinds. They had also instituted, through their own officers, a number of necessary scientific investigations. Many of these inquiries are incomplete, but they have arrived at conclusions on three questions which are of urgent importance.

The three questions are:—(1) "Are some sorts of land unsuitable for the purification of sewage? (2) Is it practicable uniformly to produce by artificial processes alone an effluent which shall not putrefy, and so create a nuisance in the stream into which it is discharged? and (3) What means should be adopted for securing the better protection of rivers?"

The conclusions formed on these points are that no land is entirely useless, but that peat and stiff clay lands are generally unsuitable for the purification of sewage, and that their use for that purpose is always attended with difficulty, and that where the depth of top soil is very small, say six inches or less, the area of such lands which would be required for efficient purification would in certain cases be so great as to render land treatment impracticable.

The Commissioners say they are not in a position to express an opinion on the relative merits of the several artificial processes, nor can they at present make a complete comparison between land treatment and artificial treatment of sewage, or state how far the purification of sewage can be uniformly effected by one or another artificial process, and at what cost as compared with land treatment. Only experience of a prolonged and varied character can solve these points. They are satisfied, however, that it is practicable to produce by artificial processes alone, either from sewage or from certain mixtures of sewage and trade refuse, such for example, as are

met with at Leeds and Manchester, effluents which will not putrefy, which would be classed as good according to ordinary chemical standards, and which might be discharged into a stream without fear of creating a nuisance. They think, therefore, that there are cases in which the Local Government Board would be justified in modifying, under proper safeguards, the present rule as regards the application of sewage to land.

Answering the question "What means should be adopted for securing the better protection of rivers?" the Commission consider that the Rivers Pollution Prevention Act, 1876, has not resulted in their general purification, and that it will be desirable for some time to come that scientific experiments be carried on in order to ascertain all the real dangers of pollution, against which they should be protected. They further add, "It is, perhaps, scarcely for us to say what arrangements should be made, but we are of opinion that the general protection of our rivers is a matter of such grave concern as to demand the creation of a separate Commission, or a new department of the Local Government, which shall be a supreme rivers authority, dealing with matters relating to rivers and their purification, and which, when appeal is made to them, shall have power to take action in cases where the local authorities have failed to do so."

The adoption of this recommendation will remove some embarassments to processes of treating sewage by bacterial agencies which are known to be efficient. It will, I think, further tend to economy. It is noticeable that the Commissioners employ the term "artificial processes" as applied to the purification of sewage by bacteria. It is not clear why this term "artificial" is used in this connection. Surely nothing is more natural than that the functions of the bacteria should be induced to begin, continue and complete the work of purification of excreta. It is quite intelligible, on the other hand, that chemical treatment should be regarded as an artificial process.

Thirty-first Annual Report of the Massachusetts State Board of Health. London: P. S. King and Son. Price 14*s*.

This volume is a worthy successor of previous reports, and affords excellent and instructive reading. The bulk of the report is that relating to sewage and water filtration. Some of the experimental sewage filters have now been in operation twelve years, and much care seems to have been shown in conducting experiments. Septic tank methods have been tested, and in the main the results confirm those made in England. Marked evidence has been obtained that the greater the amount of organic matter in a sewage entering a septic tank, the greater will be the percentage reduction of organic material by septic tank treatment. Acting on this idea, sludge derived from settling tanks has been treated by itself in septic tanks, but the results were not quite satisfactory. After forty-eight hours' treatment, 75 per cent. of the organic nitrogen and 73 per cent. of the carbonaceous matter were removed, but the tank was found to be slowly filling up with undissolved organic matter. Open and closed septic tanks were tested under similar conditions against each other with practically identical results in purification, the closed tanks giving slightly better results. Frequent removal of deposit from a septic tank is deprecated as interfering with the ripening of the effective bacterial growth. "Movement of gas in the tanks causes very finely divided solid matter to come over in the effluents, but this is rapidly oxidized by the filters." A greater percentage of change occurs with the carbonaceous than the nitrogenous matters entering a tank.

Our English experience that the clogging of intermittent filters is due to paper, cellulose, &c., and that such matters remain for a long time without change are confirmed, and the fact that the dissolution of such substances is best secured anaerobically in the septic tank is emphasized. It appears that the bacteria which do the larger proportion of work live on the sides, top and bottom of the tanks, and attempts were made to increase their numbers by passing sewage slowly up through broken, stone much as in Scott-Moncrieff's system, but the results so far are not so good as those of the septic tank. Certain experiments are quoted which show that a too prolonged anaerobic action impedes subsequent purification by lessening nitrification. How and why is not clear.

"Contact" filters of coke, cinders and clinker gave similar results to those obtained in England: the rate of filtration averaging 550,000 gallons per acre per day, with a diminution in water capacity from 55 to 43 per cent. of open space in two months, after which a permanent condition was reached. Intermittent flooding of the filters was tried to introduce more air, and determinations were made at intervals of the amount of dissolved oxygen in the effluents in order to see whether this air was used up, the idea being that if the action were one of oxidation it would be useless to retain the sewage in the filter when the oxygen was all consumed. This limit was reached within two or three hours of the completion of the flooding. This is a novel idea, and might be tried in the working of secondary contact beds in this country.

Some experiments were made with aerated filters with no opportunity for anaerobic action; these were unsatisfactory, as choking resulted, which persistent aeration failed to remove, but which anaerobic action would have quickly dissipated.

The section on water filtration is less interesting than in some former reports, but one notes a statement that "it is of more importance that a filter shall remove all of the few disease germs that may be present in a polluted water than 99 or even 100 per cent. of the ordinary harmless water bacteria present." A further statement is that "the typhoid bacillus cannot occur naturally in water without the occurrence of large numbers of *B. coli communis*, and the determination of the absence of this latter germ from filtered water is conclusive evidence, we believe, of the absence of the typhoid germ." This is a view which most of us unconsciously adopt in forming estimates of efficient filtration, though perhaps not disposed to enunciate the belief quite so dogmatically.

Mosquitoes and Malaria. By C. Christy, M.B. London: Sampson, Low and Co. 1900. 6*s.* net.

This is a very good summary of knowledge on the subject, and if the volume does not include everything known and published up to the present time, it is mainly due to the extraordinary and rapid progress made. The book contains five full-page plates, which are excellent. The importance of the subject of the connection between mosquitoes and malarial prevalence is so great and interesting, and the practical bearing upon sanitation so obvious, that a perusal of this small work is well worth the consideration of all officers.

Reports to the Malaria Committee of the Royal Society. Third Series. London: Harrison and Sons. 1900. 2*s.* net.

These reports are from observers who have been studying malarial fevers mainly from the point of view of etiology, and add considerably to our knowledge of the spread and prevalence of malaria. Perhaps the most interesting report is one by Drs. Stephens and Christopher, upon the malarial infection of native children. They show the precise nature and character of the infection itself and the variations that occur in it from time to time. They consider that, in natives of the West African Coast, two conditions are met with—viz., a condition of infection in young children without any febrile disturbance, and a condition of active immunity in adults. The former is due either to a natural insusceptibility of the native African to malaria, or to an immunity transmitted from the parent to the offspring. The second, or adult condition of immunity, is probably the result of many years of infection with parasites, and is accompanied by a progressively scantier development of parisites, and is comparable to that described for infection by several other micro-organisms.

Report on an Experimental Investigation into Methods of Inoculation against Rinderpest. By Captain Rogers, I.M.S. Simla: Government Press.

This is a valuable report made to the Government of India upon the prospects of applying to Indian cattle various methods of inoculation so successfully adopted in South Africa when dealing with rinderpest outbreaks. Extensive trial was given to Koch's bile, Edington's glycerine bile filtered bile, and serum. The advantages and disadvantages of each are fully discussed. The weight of evidence is in favour of serum inoculations which afford immediate and full immunity, and modify an attack of the

disease which an animal may have contracted one or two days before its use. The whole report is extremely suggestive and well worth perusal.

The Food Inspector's Handbook. By F. Vacher. London: The Sanitary Publishing Co. 1900. 3*s.*6*d.*

This is really a third edition of certain notes which the author had previously published. It is one of those little books which the military medical officer will find extremely useful in connection with ration and general food inspection.

The Journal of Hygiene. Edited by G. F. Nuttall, M.D., J. S. Haldane, M.D., and A. Newsholme, M.D. London: C. J. Clay. Price 5*s.* net.

This is a new quarterly production, and introduced by the editors as having been founded in order to meet a need which has been long felt for a journal devoted to the publication in the English language of original work in hygiene.

Four numbers of this new quarterly have appeared, each containing articles of interest and value. To a large extent this venture will meet a want, but it is regrettable that, in making this new departure, the publishers and editors have not been able to incorporate good summaries in the English language of the chief foreign papers on hygiene. Such a summary is greatly needed, for at present British workers have to depend mainly upon the *Centralblatt fur Bakteriologie, Parasitenkunde und Infektions Krankheiten.*

Hygiene and Public Health. By Louis Parkes M.D., and H. R. Kenwood, M.B. London: H. K. Lewis. 1901. Price 21*s.*

This is an expansion, both in size and scope, of the originally smaller volume written by Dr. Louis Parkes. In most particulars the book has been brought well up to date, but to some the chapters may appear somewhat uneven. In a work of this kind, this is a defect very difficult to avoid. A true scientific spirit is noticeable through the book, and both students and graduates will find this volume a useful focus of knowledge on all matters embraced under public health.

The Science of Hygiene. By W. C. Pakes. London: Methuen and Co. 1900. Price 15*s.*

This is really a textbook of laboratory practice. It more than covers the whole of the laboratory work required from candidates for the various diplomas in public health, and embraces much which will be useful to those who have already taken those certificates. The earlier pages of the book are devoted to bacteriological methods, and constitute an excellent scheme for work under a competent teacher. To many this volume will be of use, as it affords within one cover information which can usually only be gathered from several different textbooks.

A Practical Guide to the Public Health Acts. By T. W. Hime, M.D. London: Bailliere, Tindall, and Cox. 1901. Price 15*s.*

This may be described as a *vade mecum* for officers of health, and is a mine of information of every kind bearing directly or indirectly on public health. It is essentially a book rather for the qualified man than the student. Notwithstanding the fact that the scheme of the book is not easy to follow, it must be regarded as a necessary adjunct to every sanitarian's library.

Report of the Thompson-Yates Laboratories. Liverpool: University Press. 1900. Vols. I and II.

It is evident from these reports that excellent work in the domain of hygiene and tropical medicine is being done in these Liverpool laboratories. One cannot in detail discuss all the contents of these volumes, but one in the second volume, by Dr. Herdman and Dr. Boyce upon "Oysters and Disease," is especially interesting. Some further reference to this is made in another part of this report.

A Handbook of the Gnats, or Mosquitoes, giving the Anatomy and Life-history of the Culicidæ. By G. M. Giles, Major, I.M.S. London: Bale and Danielson. 1900. Price 15*s.*

This is a book which ought to be in the hands of every medical officer, as it furnishes us with one of the best consecutive descriptions and summary of knowledge concerning the mosquito in the English language. To the physician practising in malarious districts this book should be invaluable. The type, illustrations, and general appearance of the book are excellent.

The Microscopy of the Starches. By H. Galt, M.B. London: Bailliere Tindall and Cox. 1900 Price 3*s.* 6*d.*

We have here a scientific account of the various starches, and anyone called upon to identify a sample of cereal knows how difficult the task may be. A feature of this book is that great stress is laid upon the measurement of the grains, and as all the photo micrographs have either 116 or 380 diameters magnification no difficulty is experienced in making comparative measurements of the grains. The book is one likely to be of great use to analysts, medical officers and others engaged in the inspection of foods.

Food and the Principles of Dietetics.—By R. Hutchison, M.D. London: Ed. Arnold, 1900. Price 16*s.*

This is a book which may be considered a textbook of the whole subject of dietetics; the need of such in English has long been felt, and one must welcome this volume as a serious and fairly successful attempt to fill the blank. Much of the book is devoted to a description of individual foods, and affords most interesting reading. The chapters on bread and alcohol are extremely good. The difficult subject of relative food values, especially between animal and vegetable food stuffs, is well discussed; but one notes with regret that the equally difficult and important question of the general principles of dietetics is not quite so satisfactory. These chapters are somewhat vague, and at times misleading. This is particularly apparent in the chapter on potential energy of diets. We note that much importance is attached to mere values in terms of nitrogen and carbon. This was formerly much relied upon, but I think wrongly, as it tends to cause one to make insufficient allowance for the varying oxidation of carbon atoms, that is allowing equal value to the more readily oxidised carbon of carbohydrates as to the less oxidized carbon of fat.

Some of the best parts of this book are those discussing the needs of children's food and the difficulties of feeding in disease, especially by artificial and predigested foods. Few books have given me greater pleasure in reading than this, and it is to be hoped that military medical officers will consult it, both on account of its value as a sanitary guide, but also as an aid in the management of the dietary in the sick room.

The Economic Disposal of Town Refuse.—By W. Goodrich. London: P. S. King and Son. 1901. Price 10*s.* 6*d.*

The disposal of dustbin refuse so that it shall not become a danger to health is one of the most difficult problems with which communities have to deal. Destructors are the only practicable methods under modern conditions. The whole of this book is concerned with practical descriptions of different types of destructors, and brings into focus much information which is of great value for reference.

Twenty-ninth Report of the Medical Officer to the Local Government Board. London. 1901. Eyre and Spottiswoode.

As usual this report is full of interest, and testifies to the enormous amount of good work which this department is doing. This work may be conveniently divided into (1) the precautions taken for the prevention of small-pox—in other words, vaccination; (2) the local inquiries made respecting insanitary areas and towns visited by infectious diseases; (3) the statistics relating to infectious diseases and their mortality.

The vaccination officer's report refers largely to children whose births were registered during 1897. From the tables given it appears that of 929,518 births, 62·4 per cent. were successfully vaccinated; 11·2 per cent. died unvaccinated; 0·3 per cent. were said to be insusceptible to vaccination, and 3·4 per cent. were not vaccinated under the conscientious objection clause of the Act of 1898. Accurate information is wanting as to the 22·7 per cent. remaining. This percentage of defaulting or unreturned cases is larger than that in any record which has previously been made in England and Wales. In London, the number in default was 29·1 per cent., and for the rest of the country was 21·6 per cent. Appendices are given showing the results of vaccination inspection, and of the work of the animal vaccine establishment, at which during the year 1899–1900, 2,614 primary vaccinations were performed. Owing to the arrangements at the Jenner Institute for Preventive Medicine under the national vaccine establishment proving inadequate, further steps were taken to set up

several similar establishments on a wider basis. Dr. Blaxall reports on the operation of the glycerinated lymph establishments which are under the management of the Local Government Board, and explains the difficulties experienced in providing sufficient lymph. During the year 269 calves were sent from the department, and all of these were examined after they were slaughtered, and were found free from disease. Two others, which seemed to be in health during the course of the vaccination, were found later on to be suffering from tuberculous disease. The lymph which had been obtained from these calves was destroyed, and none of it issued. It is not stated if any examination was made of this lymph before its destruction.

The local investigations made in regard to the incidence of disease in particular places, and the tracing out of the conditions under which outbreaks of preventable disease occur constitute a large proportion of the work done. Some of the facts, notably the sanitary conditions of Windsor, Falmouth, and Chichester, are striking records of the unsatisfactory state in which some places holding high positions in public estimation have been allowed to get owing to neglect of sanitation and failure on the part of local authorities to keep abreast with the times. Some of these reports are models of exact observation and plain speaking.

The statistics relating to infectious diseases and of the mortality which occurs from them do not lend themselves readily to review; they have all appeared periodically in the professional press, and do not need repetition here.

The other portions of this report consist of the auxiliary scientific investigations which were undertaken by the medical officers of the Board, and of the precautions taken against plague. The more important features of these have been discussed elsewhere in this report under the heading of "Special Points in Hygiene."

The Theory and Practice of Military Hygiene.– By Captain E. L. Munson. Med. Depart. United States Army, New York. 1901. William Wood and Co.

This volume is an outcome of the lessons learned during the recent Spanish-American War. It is a large volume, and deals thoroughly with all the points and questions connected with the hygiene of the soldier. The book is wonderfully free from abstruse formulæ and pseudo-scientific explanations, the author handling his subject in a practical way. After a close perusal of this work, I consider it as likely to meet a real want, for none of our English works on hygiene—not even those which have emanated from Netley—have really discussed military hygiene exclusively from the soldier's standpoint. Being primarily written for Americans, the United States soldier naturally occupies a prominent place, but not unduly so, very considerable sections being devoted to comparative reviews. One of the best chapters in the book is that dealing with the food and dietaries of soldiers in tropical climates. This is not only quite up to date, but thoroughly in harmony with my own views, that for the ordinary peace ration in the tropics an excessive use of proteid food is the great blot in current dietaries, and that in attempting to formulate emergency rations we must have recourse largely to some of the newer artificial foods, such as tropon, plasmon and the like. So impressed am I with the value and merit of this book that I strongly urge its perusal by all officers in military employ.

Studien zu einer Physiologie des Marsches. (Studies in the Physiology of Marching).—By Dr. Zuntz and Dr. Schumburg. Berlin: A. Hirschwald. 1901. Price 8*s*.

This is a very remarkable work, issued under authority of the German military medical authorities, and setting forth the results of an elaborate inquiry made into the metabolism of soldiers when performing certain exercises. The book is full of figures and details of a highly technical nature. It is a monument of most laborious labour, and furnishes facts of the highest importance to the army medical officer. The more salient points I have discussed in another section of this report, but to be fully appreciated the book should be carefully read and studied in the original.

APPENDIX No. II.

LIST OF OPERATIONS PERFORMED AT THE ROYAL VICTORIA HOSPITAL, NETLEY, DURING THE YEAR 1900-1901: WITH NOTES ON SOME OF THE OPERATION CASES OF INTEREST AND REMARKS ON SOME OF THE WORK IN THE SURGICAL DIVISION.

By Major W. Dick, M.B., F.R.C.S., Ed., Royal Army Medical Corps, Assistant Professor of Military Surgery, Army Medical School, Netley.

Operations.	Number of cases.	Diseases, &c.	Results.				Remarks.
			Completely successful.	Partially successful.	Failed.	Died.	
Removal of carious bone	10	Caries	8	—	—	—	2 remaining in hospital.
,, ,, sequestra ...	66	Gunshot wound ...	57	—	1	—	8 remaining in hospital.
,, ,, ,, ...	7	Necrosis	7	—	—	—	
Incision and drainage ...	9	Abscess of liver ...	4	1	—	4	
,, ,, ,, ...	3	Chronic abscess ...	1	—	—	1	1 remaining in hospital.
,, ,, ,, ...	1	Empyema	—	—	—	1	
,, ,, ,, ...	16	Abscess	13	2	—	1	
,, ,, ,, ...	2	Pus in joint ...	2	—	—	—	
Excision of veins ...	10	Varix	10	—	—	—	
,, ,, ,, ...	2	Varicocele	2	—	—	—	
,, ,, tumour ...	1	Epithelioma ...	—	—	1	—	
,, ,, cyst	1	Sebaceous	1	—	—	—	
,, ,, glands ...	12	Tubercle, syphilis ...	10	1	—	—	1 remaining in hospital.
,, ,, eyeball ...	3	Panophthalmitis, new growth, &c.	2	1	—	—	
,, ,, articular cartilage.	2	Loose cartilage in knee-joint.	2	—	—	—	
Amputation of toes ...	2	Gangrene after enteric fever.	2	—	—	—	
,, ,, forearm	1	Burn	1	—	—	—	
,, ,, finger ...	1	Disease of joint .	1	—	—	—	
Disarticulation of thigh ...	1	Gunshot wound ...	1	—	—	—	
,, for wounded	5	Gunshot wound ...	2	2	—	—	1 remaining in hospital.
,, for radical	61	Hernia	61	—	—	—	
	3	Hydrocele	3	—	—	—	
	219		190	7	2	7	13

Operations.	Number of cases.	Diseases, &c.	Results.				Remarks.
			Completely successful.	Partially successful.	Failed.	Died.	
Brought forward ...	219	Brought forward ...	190	7	2	7	13
Sinuses laid open and scraped.	8	Tubercle, syphilis ...	3	2	—	—	3 remaining in hospital.
Operation on urethra ...	4	Perineal fistula, &c.	4	—	—	—	
,, for piles ...	3	Piles	3	—	—	—	2 remaining in hospital.
Division of sphincter ...	5	Fistula in ano ...	3	—	—	—	
Operations on testicle ...	6	Tubercle, syphilis...	6	—	—	—	
Plastic operations ...	2	Gunshot wound, urethral fistula.	2	—	—	—	
Removal of foreign bodies	16	Bullets, wire, ligatures.	16	—	—	—	
Operations on nerves ..	5	Gunshot wound ...	5	—	—	—	
Circumcision	4	Paraphimosis, new growth.	4	—	—	—	
Ligature of popliteal artery.	1	Aneurysm after gunshot wound.	1	—	—	—	
Ligature of axillary artery.	1	,, ,,	1	—	—	—	
Laparotomy	2	Malignant tumour, foreign body.	1	—	—	1	
Tenotomy	1	Contraction of tendo achillis after gunshot wound.	1	—	—	—	
Resection of rib	4	Empyema	1	2	1	—	
Trephining of bone ...	2	Abscess in bone ...	2	—	—	—	
Operations for appendicitis.	5	Appendicitis ...	2	1	—	2	
Breaking down adhesions	3	Adhesion, contraction, gunshot wound, &c.	4	4	—	—	
Reduction of dislocation	1	Shoulder	1	—	—	—	
Deepening orbit	1	Contraction of cicatrices.	1	—	...	—	
Aspiration of liver ...	3	Liver abscess ...	—	—	3	—	
Total	301		251	16	6	10	18

Notes and Remarks.

Removal o
Carious bo

Of the ten cases operated on, eight were successful, and two still remain in hospital; they are both due to tubercular disease of the femur, and have both been operated on several times. One wound heals up, and then another breaks out, each time with carious bone at the bottom. Two of the cases may be recorded—one, a non-commissioned officer of the Loyal North Lancashire Regiment, came home from South Africa in May, 1900, stating that he thought he had been struck on the head by a shell; he had suppurating wounds over both parietal eminences, and bare bone could be felt at the bottom of them; he had uncontrollable neuralgia. In the beginning of June flaps were reflected on both sides of the head, when the outer table of the skull in both places was found carious, and the inner table apparently depressed but with no sign of fracture; the carious bone was scraped and gouged away. The left side at once healed up, but the right continued to discharge. He was then found to have chronic Bright's disease. He slowly improved and after nearly a year the second wound healed. The other case was that of an officer who had been kicked by a horse in 1893. He had been operated on, but an abscess now formed. This was opened and a hole in the femur scraped out. This was in January, it healed up and has remained sound.

Removal of sequestra.

Operations for the removal of sequestra were performed in seventy-three patients; sixty-six of them having had gunshot wounds, and the necrosis in the other seven cases being due to other causes. Many of these patients have had two and three operations before a satisfactory result was obtained. The cures have varied from a fairly simple condition to all states of comminution of bone, and the portions of bone have been mixed with numerous fragments of metal from broken up bullets. The results on the whole have been satisfactory, although in many cases there has been great deformity, with ankylosis of joints and injury to nerves. Of the cases due to gunshot, fifty-seven were completely successful in so far that complete healing took place, although a great number of them, on account of deformity, &c., were unfit for further service. The cases where the necrosis was due to other causes all recovered.

The following are some of the more interesting of the cases:—

Drummer B., 1st Leinster Regiment, was wounded at Slapkrantz on the 28th July, 1900, by a bullet, which fractured the skull just above the external angle of the right orbit; some bone had been removed in South Africa. He was invalided, and arrived home on the 28th January, 1901. He had then headache, and some bare bone could be felt in the sinus left by the wound. The old wound was enlarged, and four pieces of dead bone were removed, exposing the pulsating dura mater. The wound healed in three weeks, and he went out fit for duty.

Gunner G., Royal Horse Artillery, was wounded by a Mauser bullet at Sanna's Post, 31st March, 1900. The bullet entered the right frontal sinus and destroyed the right eye, which was taken out at Bloemfontein. Discharging fistulæ continued over the frontal sinus, and when he arrived home here, an incision was made into the sinus, and a piece of necrosed bone removed, after which healing was rapid, and he was discharged in six weeks.

In another case a Mauser bullet entered at the angle of the mouth on the right side, passed through the lower jaw, then entered on the right side of the chest, making a superficial track. On arrival home the wound of the chest had healed, but some necrosis had to be removed from the jaw. He then rapidly recovered.

Private H., Royal Highlanders, was wounded at Magersfontein on the 11th December, 1899. The bullet entered in the right buttock, passed through the pelvis (said to have passed through the bowels), and emerged in the left buttock behind the great trochanter. On arrival at Netley he had a long sinus from the exit wound, in which bone could be felt. This was opened up and several pieces of dead bone removed from the anterior surface of the sacrum. Healing then took place, and eventually, on the 16th October, 1900, the man was discharged to duty.

Private B., Royal Canadians, was wounded at Paardeberg, 27th February, 1900. The bullet entered the left elbow, behind, and came out at the shoulder, injuring the musculo-spiral nerve in its course, and breaking up the bones of the elbow joint. He arrived in England on the 23rd May, and an incision was made into the elbow joint on the 14th June, when several necrosed pieces of the ulna were removed. He made then an excellent recovery, with some stiffness of the elbow joint. The musculo-spiral nerve recovered its functions. He was discharged unfit on the 4th September, 1900.

Private D., 2nd Lincoln Regiment, was wounded in the Orange River Colony on the 20th August, 1900, by a revolver bullet, which entered at the middle of the axillary border of the right scapula, and came out at the tip of the shoulder; the humerus was fractured. He arrived home in December, when there were sinuses and want of union of the fractured humerus. The sinuses were laid open and pieces of necrosed bone removed. After this the humerus united, but sinuses still persisted: for which he has again been operated on, and still remains in hospital. Another revolver bullet entered the right side of the ninth dorsal spine, and emerged five inches below the right nipple; but as this wound had healed, and gave no trouble on arrival, it is impossible to say what was injured.

Corporal S., Imperial Yeomanry, was wounded at Krugersdorp by a Mauser bullet which entered the back of the right upper arm close to the

elbow, and lodged in the shoulder. Three weeks after the wound, the upper end of the humerus was excised. There had been injury to the musculo-spiral nerve. A sinus remained in the incision. In February some dead bone was removed from this, and again in March of this year some more was removed. The sinus then healed, and he went out with a flail shoulder joint. The nerve lesion had been nearly recovered from on discharge.

Two cases of shell wound of the forearm were operated on. In one when the sequestra were removed it was found that the ulna was ununited, there being considerable deficiency of the shaft. The wound healed up at once, and strong fibrous union took place, and the man was discharged with a very useful arm, the radius, which had also been fractured, having bony union. In the other case both bones were fractured, and bony union had taken place between the radius and ulna, so that supination and pronation were gone. After removal of sequestra the wounds healed.

In a great number of the cases of gunshot fractures of the femur, no matter how much comminution, union seems to take place, but dead pieces of bone are enclosed in the callus, which eventually give rise to persistent sinuses, and are very difficult to remove, necessitating operation after operation till all are removed.

Lance-Corporal H., King's Royal Rifles, was wounded at Paardeberg on 18th February, 1900, by a Mauser bullet, which entered over the right trochanter, and came out on the inside of the thigh, fracturing the femur, then perforated the flesh behind the left femur, causing injury to the left sciatic nerve, but without complete division. There were persistent sinuses about the upper part of the right thigh when he arrived at Netley. On the 22nd June, 1900, the upper part of the right femur was chiselled open (union having taken place), and several imprisoned pieces of dead bone taken away. The sinuses then healed, but as he had very considerable shortening, he was fitted with an O'Connor extension boot, and discharged from the service on the 7th September.

Private C., Lancashire Fusiliers, was wounded at Spion Kop, 24th January, 1900, a bullet going through the right femur. When he arrived at Netley the femur was ununited, but the wounds had healed. Some time afterwards great swelling ensued, so on the 15th August an incision was made on the front of the thigh and a large abscess evacuated, the abscess going round the femur. At the same time a small spicule of bone was removed; the sinus then persisted, and some months afterwards a considerable piece of bone was removed: and the man was not sufficiently recovered to go out until the 5th March, 1901.

Private D., Coldstream Guards, was wounded near Middleburg, on the 30th September, 1900. The bullet entered behind the right thigh, fractured the femur, and was taken out two months afterwards in front of the middle of the femur. On arrival home there were three discharging sinuses, and dead bone could be felt: the femur had united. The sinuses were enlarged, and twenty-nine pieces of loose bone were taken away from the shaft of the femur. The patient progressed favourably and two months afterwards he was discharged from hospital unfit for further service, as he had a stiff knee, and two and a half inches shortening.

Lance-Corporal T., Welsh Regiment, was wounded at Paardeburg on the 18th February, 1900, by a Mauser bullet, which perforated the right tibia, causing a traumatic aneurysm of the posterior tibial artery. The artery was tied on the 3rd March. Sinuses remained; these were cut down upon in the beginning of July, and several small pieces of dead bone were removed; also two silk ligatures, which were evidently those used for tying the artery. Patient progressed favourably, and was discharged fit for duty in November.

Lieutenant F. was wounded in the right leg near Amsterdam on the 14th February, 1901. The bullet entered the calf and came out through the front of the tibia. He arrived at Netley on the 20th April, and three days afterwards both wounds were opened up, when a large hole, through which one could put a finger, was found right through the tibia. A considerable quantity of bony *débris* was scraped out after which the posterior wound quickly healed, but the anterior (exit) wound took a much longer time.

However, this also eventually healed, and he proceeded on sick leave on the 1st July.

Trooper H., Australian Bushmen, is interesting, from the number of bullets by which he was wounded. He was wounded on the 22nd August, 1900, near Zeerust. One bullet entered the right elbow, necessitating amputation above the joint. A second bullet entered below the right patella and came out to the inside of the tibial tuberosity; a third bullet made a scar on the right thigh; a fourth entered the middle of the right thigh and came out behind; and a fifth passed through the calf of the left leg. The only one of these that gave any trouble after his arrival home was the second, which had made a hole in the tibia. When this was scraped out he rapidly got well.

The only case of necrosis due to other causes than gunshot wounds worth mentioning, is that of a man who had had a loose cartilage in his knee-joint for eight years; this was removed at Pretoria on the 3rd September, 1900. The operation was followed by septic cellulitis. He was invalided home, arriving early in 1901; dead bone could then be felt in the joint. This was removed, and healing took place almost immediately, but he had to be invalided, with a stiff knee-joint.

cess of r. There were nine cases of abscess of the liver operated on; four of these made complete recoveries, and four died, while one went out with a discharging sinus.

Private B., King's Royal Rifles, was attacked by dysentery in South Africa about the middle of April, 1900, and he got pains in the liver in May; this disappeared, but recurred in June. He arrived home on the 5th July, and for the next twelve days had a temperature pointing to abscess. On the 17th he was unsuccessfully aspirated in the eighth right interspace; this gave no relief, and on the 21st he was again aspirated, and pus was found. The abscess was now incised, and two inches of the eighth rib removed for purposes of drainage. The pus was sterile and remained so. The tube was removed on the eighteenth day, and the incision had healed on the twenty-ninth day. He went out fit for duty on the 18th September.

Corporal M., Royal Lancaster, was another case who suffered from dysentery in South Africa, commencing in May, 1900. In August he had pain in right side. Previous to this, in July, he had right pneumonia. On the 10th of October he was aspirated, pus found, and an incision made between the eighth and ninth ribs, and 40 ounces of pus evacuated; no rib was excised, as there was plenty of room for drainage. An amœba (doubtful) was found in pus; six days after the operation the pus was not sterile. He had no rise of temperature after the operation. The tube was removed on the thirteenth day after the operation, and he was discharged fit for duty on the 15th November.

The third case that went out fit for duty, followed dysentery contracted in South Africa, although he had had dysentery in India previously. On the 21st November he was aspirated in five different situations, but pus was not found, probably due to too small a needle having been used. Fever continued and he got intense pain over the cæcum, and the dulness increased both upwards and downwards. On the 11th December again aspirated, found pus; incised and evacuated 35 ounces. He slowly recovered, and went out on the 8th February, 1901.

The fourth case had been operated on for abscess of the liver in January, 1901, but when he arrived home here he was very weak, and there was a large fluctuating tumour in the *left* lumbar region. This was incised, and then a finger could be directed right across in front of the spine, and the abdominal organs made out. This abscess no doubt was connected with the original liver abscess. It healed up by granulation, and the man was discharged fit for duty.

The case shown as partially successful was a foreign invalid from India. He is stated to have had diarrhœa (probably dysenteric), and was aspirated for hepatic abscess in January, 1901. On the same day as the aspiration the abscess burst through the right lung, and he then continued to cough up large quantities of liver pus. In May, 1901, on his arrival home after aspiration, the abscess was opened in the sixth interspace. He then stopped coughing it up for two months, but after this time he again began to

cough up a little, but was much better than previously. He was discharged unfit.

Of the four cases that died, one on post-mortem examination was shown to have several small abscesses round the large cavity that had been opened in the right lobe; he also had an unopened abscess in the left lobe the size of a walnut. This man had dysentery in South Africa. When operated on, 60 ounces of pus were evacuated, and afterwards he suffered several times from hæmorrhage from the liver substance. The second case, also from South Africa, had had dysentery in November, 1900, followed by enteric fever in December. On arrival home here he had a large hepatic abscess, and was in a very weak condition. After operation and evacuation of pus, the discharge was mainly bile, and he never regained strength. My experience is, that where there is a large discharge of bile following operation the result is unsatisfactory. The post-mortem examination showed only that the whole of the right lobe of the liver was a cavity with very thin walls.

The third case, from South Africa, had had no recent dysentery, but had suffered much from ague, and also gave a history of having been recently kicked in the hepatic region. At the operation two pints of pus were evacuated. He never improved. Post-mortem examination showed a cavity larger than a man's fist in the right lobe, communicating with the pleura, which was lined with a thick purulent material, the right lung being completely collapsed.

The fourth fatal case came from India. He had acute enteritis in 1895, and also in 1897. He was admitted in India in January, 1900, with a hepatic abscess which had burst through his lung; he was there operated on for what apparently was an empyema. On one occasion, after arrival home, he nearly died of syncope when his pleura was being washed out. After arrival home the old operation wound was enlarged, as there was not free drainage, and a probe could be passed a long way up, evidently into the lung. Again portions of the seventh and eighth ribs were excised, and the cavity of the pleura scraped out. He died about five months after this from exhaustion. Post-mortem examination showed abscess cavity in liver communicating with the lung, and the lung communicating with the pleura.

Aspiration of liver.

In addition to the cases of abscess of the liver during this period, three other cases were aspirated, having symptoms pointing to abscess, but in none of them was pus found. In one of these, however, when aspirated a second time, about a month after the first time, and after the period of this return, pus was found and abscess opened. The man afterwards completely recovered.

Empyema.

One patient was operated on for empyema, in whom a rib was not excised. The patient contracted Mediterranean fever in Malta in March, 1891. This was followed by pleurisy. He was admitted into the medical division of this hospital on the 24th May, and transferred to the surgical division two days afterwards; he was then in a very exhausted state. On the same day, after aspiration, his right pleura was incised, and 100 ounces of very thick pus evacuated. This gave relief to the breathing, but he did not recover to any appreciable extent, and gradually became weaker, and died on the 6th June. The post-mortem examination showed the right lung to be completely collapsed, and the left in a state of chronic pneumonia. No tubercle bacilli were found.

Abscess.

There were sixteen cases of abscesses in various localities which were sufficiently important to require an anæsthetic before opening them; of these, thirteen recovered, in two the operation was only partially successful, there being tuberculous abscesses which left sinuses which remained open, and one case died, this being a case of tuberculous abscess in the neighbourhood of the hip-joint and also by the side of the rectum, the man eventually dying of lardaceous disease of the kidney. One of the cases is interesting in the matter of diagnosis. In October, 1900, the man felt he had a growth in the left iliac region; this gradually got bigger, and at Bloemfontein it was diagnosed as a malignant tumour, and he was invalided home. He arrived here on the 9th March, 1901, with a hard tumour which seemed to go deeply into the abdomen. The man gave a history of it affecting his bowels and making his motions smaller. On the 17th March an incision was made in the middle abdominal line without opening the peritoneum;

the tumour was then examined from behind and found to be entirely extra-peritoneal. This wound was then stitched up, and an incision made over the swelling, which was found to be inspissated pus with a hard thick capsule. Both wounds healed rapidly, and the man went out fit on the 25th May.

Incision of elbow joint.

During the year there were two cases in which incision of the elbow joint was performed, both for pus formation.

Private W., 1st Welsh Regiment, was admitted into Ahmednagar hospital on the 5th July, 1899, with synovitis of the right elbow. He was invalided home and arrived at Netley on the 6th April, 1900, with a stiff elbow. He was then put under an anæsthetic and an attempt made to move the joint. Shortly afterwards pus formed in the joint, and on the 1st June the joint was incised and a quantity of pus evacuated; the olecranon process was then found to be necrosed and it was removed. Pain became intense, and the patient did not do well. On the 22nd June a long incision was made along the right ulna, and the upper half of the bone was found to be soft and friable; this was all removed, and the patient then began to mend. The wounds healed up, and a fair amount of movement was restored to the joint. The operation was done subperiostially, and the bone was renewed up to half an inch of the joint. He went out with a fairly useful arm on the 6th November, 1900.

The second man is stated to have had enteric fever and uræmic convulsions in South Africa. He was invalided, and arrived at Netley 10th September, 1900, with abscesses all round and communicating with the left elbow joint. Five days after arrival home the joint was freely incised, and he did remarkably well. Healing took place rapidly, and he went out on the 8th February, 1901, in excellent health, but with an ankylosed joint.

Excision of veins.

There were twelve operations for excision of veins, ten for varix of the legs, and two for varicocele, all of which did well. Two of these cases were operated on both legs, one leg about three weeks after the other, as to operate on both at the same time causes the patient to be too helpless. One of them had been operated on in 1895, prior to enlistment, in the right leg, but varicosity of the veins had returned, as well as new veins in the left leg. They were all done in the same manner, viz., by numerous small portions of vein being excised in the course of the veins principally affected.

In the two cases of varicocele the high operation was performed; unfortunately both of them suppurated, but the result was eminently satisfactory in both. Although the incision is much in the same place as that for radical cure in hernia, the experience is that these cases suppurate, while the hernia cases do not.

Excision of tumour.

This was a case of epithelioma of the nose. The man, an Australian, was scratched ten months before admission, and the growth, he thinks, commenced after this. This occurred at Vryberg, and twice, in South Africa, operations were undertaken for its removal, but unsuccessfully. He was admitted here on the 6th May, and on the 13th a large portion of the left side of the nose and the septum were removed, apparently wide of the growth. The case seemed to do well for six weeks, but after this it was found that the superior maxilla and the orbit were affected. The man declined to have any further operation.

Excision of glands.

The following two cases present some features of interest:—

Major H. came home on the 3rd January, 1901, with a history of an injury to the right index finger, and that lymphangitis had followed attending septic cases, in September 1900, at Nauwport. A gland above the clavicle and some in the axilla had been removed. When he arrived here he had a long sinus leading into the apex of the axillary space, and a mass of hard indurated glands along the lower border of the pectoral muscles. On the 5th January a large flap was reflected backwards, including the sinus, which was well scraped. The borders of the pectoral muscles were dissected clear of gland tissue, which was peculiarly hard. Healing was very rapid, and he went out completely recovered on the 22nd January.

A patient developed swelling of the left groin, with no definite cause; this gradually got larger and painful, and he was invalided home from India.

On the 23rd May the glands were removed, having an appearance like sarcoma. On pathological examination the tumour was stated to be round-celled sarcoma. He shortly afterwards developed erysipelas, and then made a rapid recovery, healing taking place. In three months he was quite fit.

Excision of eyeball.

In three cases the eyeball, was excised: in two of them because sympathetic ophthalmia was appearing in the sound eye. One of these was originally due to gonorrhœa, and the other to irido-cyclitis from glare and dust on active service. The third case had come from Egypt with an orbital tumour. This was first removed, on the 4th of March, without removing the eye. It proved to be cancerous, and quickly recurred. On the 16th April the eyeball was excised, and the growth cleared out from the orbit; but it was then found to be far back and going through the sphenoidal fissure into the cranial cavity, and nothing further could be done.

Excision of articular cartilage.

There were two such cases, both of which, so far as the operation was concerned, were successful, although one of them had to go unfit from chronic synovitis, which did not seem to be benefited by the incision into the joint. In both cases the joint was freely incised, and the capsule stitched up by buried sutures, after removal of the loose body, and both healed by primary union. In the other case the man was discharged fit for duty a month after the operation, all the movements of the knee-joint being perfect.

Amputations.

Two men had toes amputated (one of them all ten) for gangrene supervening on enteric fever.

One man had the terminal phalanx of his right thumb amputated for tubercular disease, after erasion of the terminal joint had been performed without success.

In one case amputation through the lower third of the right forearm was performed, for great contraction of the hand and lower part of the forearm, the result of being burned by a veldt fire when lying wounded and unable to move.

A re-amputation of the left thigh was performed, for conical stump and projection of the femur, in a case of gunshot wound, in which the thigh had been previously amputated in South Africa.

Amputation is now very rare in this hospital, and not one of the cases of gunshot wound from South Africa, in which the limb had been conserved there, required amputation after arrival home.

Operations for ununited fracture.

Of the five operations for ununited fracture, two were successful, two were only partially successful, *i.e.*, only fibrous union resulted, and one still remains in hospital, but there will ultimately be a successful result. The condition necessitating operation was caused in four of these cases by gunshot wounds received on active service, and the fifth was the result of an accident.

Private E., East Kent Regiment, was wounded at Dreifontein on the 10th March, 1900. The bullet entered in front just over the middle of the right ulna, and came out behind considerably lower down. Three months afterwards, when admitted into Netley hospital, there was no union of the ulna, and the fourth and fifth fingers were contracted. On the 11th June an incision was made over the seat of fracture, all tissue cleared from between the ends, which were well rubbed together, the scar of the wound was dissected out, and some contractions in the palm divided subcutaneously, but the contraction was not overcome. After two months in splints movement could still be detected. In November the fracture was again cut down upon, the fractured surfaces cleared and wired together. Primary union of the flesh wound was obtained, but no bony union took place. He was discharged in February, 1901, with strong fibrous union and a most useful arm.

Private C., Rifle Brigade, was wounded at Ladysmith on the 9th November, 1899, by a shell, which hit him on the back of the right forearm and broke both bones. On arrival home, on the 20th June, 1900, there was no union. On the 5th July incisions were made on the outside and inside of the limb over the fractures, which were very oblique, and each bone was drilled and wired. Evidently at the operation some contamination took place, as he almost immediately developed erysipelas, with great swelling and pus formation, necessitating numerous incisions. Considerable thickening took place at the sites of the fractures, but the union resulting was perfect,

although there was some loss of pronation and supination. He was discharged to furlough, prior to returning to duty, on the 19th October.

Trooper F., Victorian Mounted Rifles, had an ununited fracture of the right humerus, caused by a gunshot wound at fifty yards range. From 1 to 1½ inches of the middle of the humerus were blown away: X rays showed about 1 inch of separation between the fragments. A long incision was made on the inner side of the middle of the upper arm, and the ends of the bones cleared (the end of the upper fragment was a mere shell), and wired. The resulting union was not bony, only fibrous, although it was much stronger than before the operation.

Private M., 1st Middlesex Regiment, fractured his left patella on the 27th July, 1900, while playing cricket in India. He arrived at Netley on the 14th November; the fragments were then widely separated, the fracture being a transverse one; he could walk a little. On the 1st of January, 1901, he slipped when getting out of bed, great effusion took place into the knee-joint, and he became quite helpless. On the 6th January the patella was cut down upon by a large flap, with the convexity upwards. The joint was found full of dark blood; there was no union at all between the fragments. The joint was washed out, and the edges of the fracture, which were covered with fibro-cartilage, were sawn, and approximated, and then wired. On the first dressing, on the eighth day after the operation, it was found that a small portion of the upper part of the flap had sloughed, primary union had however taken place everywhere else. The resulting union of the patella was perfect, and the man went out on the 9th of April with a most useful limb, there only being some stiffness.

Private W., Inniskilling Fusiliers, was wounded at Pieter's Hill on the 22rd February, 1900, by a bullet, which entered in front over the middle of the left thigh, and made its exit behind, fracturing the femur into several pieces. He came home on the 5th July, there being then much movement at the seat of fracture. A skiagraph showed a number of fragments, some pieces of lead, and overriding of the main fragments. On the 14th October the ends were rubbed together and put up in plaster; this was unsuccessful, but since this, the thigh was bared and aluminium tacked on. This has been successful, although there is considerable deformity, and about 4½ inches of shortening.

Radical cure of hernia.

This year sixty-one officers and men have been operated on for hernia, all of them successfully. One officer was operated on for a recurrence of hernia. They were all, except one case, of inguinal hernia, this one being ventral. Three were cases that had been previously operated on, one of the three having been twice previously done. Six were of the congenital variety, and in two of these the testicle had to be removed. In four patients hernia was on both sides; these were not operated on at the same time, but one side three weeks after the first had been done. In seven cases suppuration occurred from contamination either at the time of operation, or from the materials used for suturing. In one of these the contamination evidently proceeded from the scrotum, an operation for hydrocele having been done at the same time. It is possible, however, that the wounds were afterwards contaminated, as it has been found difficult to prevent the men pushing their hands under the dressings and scratching when there is the least irritation.

Some of the cases that offered points of interest are recorded.

Private H., Rifle Brigade, was going over a bar at gymnasium at Dover in 1890, when he hurt himself in the right groin. In March of this year, when going out to South Africa, he slipped and hurt his right testicle; he also has a history of syphilis. In his history it is stated that he had a hydrocele tapped on the 26th April, which was very large. On arrival here in June he had a large hydrocele and an inguinal hernia on the right side. On the 29th June a radical cure of the hernia was performed, and at the same time the hydrocele was emptied, and the tunica vaginalis dissected out; this was very thick, and there was a small gummatory deposit on the testicle, which was also taken away. Suppuration occurred, and the temperature went up, and remained above normal until the sixteenth day after the operation. A staphylococcus was grown from the gumma, and may have been the cause of the suppuration. The scrotum healed up rapidly, but a sinus remained at the site of the hernial wound; this was scraped out

without effect, and eventually the wound had to be opened up and the deep stitches taken out. He afterwards made an excellent recovery.

Private D., Royal West Surrey Regiment, had a small left inguinal hernia in 1889, which disappeared in two years. When being carried from the battle of Colenso, where he was wounded in the knee, he had a fall from the stretcher, when the left hernia reappeared, and also one on the right side. He arrived home on the 25th July, 1900, and on the 4th August radical cure was performed on the right side. There was a sub-peritoneal lipoma on the sac, and to this, by a long thick filament, the omentum was attached. This filament was ligatured, and the omentum returned to the abdominal cavity, the sac with the adherent lipoma being then cut off. Healing took place by primary union. On 27th August the left side was operated on; here there was a very thin sac, to which the great intestine was adherent; in separating it some of the peritoneal covering of the gut was torn off. Healing took place by primary union. After both operations the man had retention of urine for three days.

Lance-Corporal S., Northampton Regiment, was operated on for a right inguinal hernia on the 22nd October, 1900, having returned from South Africa on the 5th. Immediately after the operation his temperature went up, and the next day he appeared flushed; the day following this he showed spots and had diarrhœa, and turned out to be a typical case of enteric fever. When questioned, he said he had felt a little unwell before the operation. His blood sedimented typhoid bacilli up to 300. The fever had no effect on the convalescence from the operation, and he went out on furlough, previous to returning to duty, two months after it.

Captain V., Dublin Fusiliers, had a right inguinal hernia, which appeared in February, 1897, when he was playing football. He was operated on in London in October, 1897; the hernia recurred in June, 1898, whilst on active service, and he came home from Natal in August. He was admitted here on the 8th November, and on the 11th the operation was performed. The incision was made through the old cicatrix; everything was matted together, and it was difficult to identify parts. There was a long sac, with several constrictions in it. Primary union took place, and he was discharged fit on the 12th December.

Gunner G., Royal Garrison Artillery, was thrown off a horse fourteen months previous to enlistment, and a right inguinal hernia appeared. He was operated on two days afterwards in a London hospital, and again a fortnight afterwards, as the hernia had returned. In November, 1900, it again returned when dismounting a gun. There was nothing remarkable about the operation, except that everything was matted together by dense cicatricial tissue.

One man had been operated on in May, 1900, in Halifax, previous to enlistment, on the left side. In July the right side appeared. On operation this was found to be a congenital hernia.

In two patients there were testicles which slipped back into the abdomen, the cases being congenital, omentum which was attached had to be removed as well as the testicles, which were atrophied and probably functionless.

Private B., Royal Irish Rifles, had been operated on six years previously when in civil life for a right inguinal hernia, in Dublin. The hernia reappeared in December, 1900, and he was sent here in March, 1901. There was nothing unusual about the operation.

One ventral hernia, just above the umbilicus, was successfully operated on.

Ribs were resected in four cases of empyema, with very little success, only one being completely successful. Resection of rib.

There were three cases of psoas abscess operated on during the year. One got completely well, one is still in hospital, and not doing well, and the third, who had an abscess on each side, developed paraplegia, and eventually died of exhaustion. Chronic abscess.

There were six of these operations, all of which were successful. One was a castration, the others were cases where from syphilitic or tubercular disease the substance of the testicle was destroyed or nearly so. In these cases the disease was scraped out, one of them being practically a double castration. Operations on testicle.

Three cases were operated on; all did well. In two cases the piles Piles.

were cut off after ligature, in the third a Whiteheads' operation was performed.

adical cure hydrocele. Three cases of radical cure of hydrocele were performed by dissecting out the parietal layer of the tunica. All three healed by primary union, the results being excellent.

perations on rethra. Of four cases operated on, three had perineal abscesses communicating with the urethra, and one had an intractable urethral fistula; all of them had stricture; they all did well.

Sapper H., Royal Engineers, was admitted into this hospital on the 18th June, 1900, having been a fortnight sick in Southampton; he had some difficulty in passing his water, which he said was the result of a chill. On the 20th June, as he could not pass water at all, and a catheter could not be passed, the bladder was aspirated, and 70 ounces of urine drawn off. The next morning a No. 1 catheter was passed under chloroform, and the stricture dilated up to No. 9 within the next five days. Then an abscess formed, which was incised on the 26th June. The stricture was finally dilated up to No. 12, and he was discharged to duty on the 14th July.

Private C., West Riding Regiment, came home from Africa on the 11th July, 1900, having been kicked by a soldier on the 1st June. Some operation had been done at Woodstock for a fistula, but unsuccessfully. He made water through the fistula; a catheter could not be passed from the meatus. An incision was made over the fistula, but the posterior portion of the urethra could not be found. At a second operation the posterior part was found with difficulty. A catheter was tied in, and he eventually did well, the fistula healed, and he was dilated to No. 10.

emoval of reign odies. In sixteen cases operations were undertaken for the removal of foreign bodies; in five of them sinuses persisted in stumps after operation; when these were laid open, and ligatures removed, healing immediately took place. In a sixth, in which the brachial artery had been ligatured for a wound in the palm of the hand, on arrival home, a sinus persisted at the site of operation, and there was some affection of the median nerve, faradic contraction of the muscles of the thumb being deficient. After cutting down and removing the ligature round the brachial the sinus at once healed up, and the thumb muscles began to recover. Probably something had happened to the nerve at the operation. In the seventh case, the wire which was supposed to be uniting the two portions of a fractured olecranon was removed, as it was causing irritation.

The remaining nine operations were for the removal of bullets or portions of bullets; eight of the cases were from South Africa, and one from China. This last case had been hit by a shell at Tientsin, on the back of the left forearm, fracturing both bones, on the 13th July, 1900. He arrived home on the 14th January, 1901. A skiagraph showed a piece of metal in front of the elbow lodged in the bones. The wound was still open, and on the 4th February this was enlarged, but the piece of metal could not be extracted; accordingly an incision was made on the front, and a piece of shell extracted. The wounds healed slowly, and he went out fit on the 12th April.

Private E., 1st Welsh Regiment, was wounded at Paardeberg; the bullet entered inside of upper portion of right thigh, and is said to have come out on the outer side, breaking the femur in its course. On arrival home, on the 24th June, 1900, the exit wound was healed, but there was much discharge from the inner wound, and there was an accumulation of matter on the outer side. The outer side was incised, and much necrosis found and removed. Fingers could be made to meet through the femur, and the crushed mantle of a Mauser bullet was extracted from the centre of the fracture. The wounds healed very slowly and before final healing some bony particles had again to be removed.

Private O'N., Royal Lancaster Regiment, was wounded at Pieter's Hill. A Mauser bullet entered on back of left ilium and lodged on the opposite side, evidently going right through the pelvis and injuring the rectum. About a fortnight afterwards inguinal colotomy was performed by Sir William Stokes. After arrival home, a Mauser bullet, flattened on one side was extracted, and a sinus passing through the pelvis was scraped out. The wounds healed, except a small sinus at the entrance wound. It was not

considered advisable to close the colotomy wound. The man was discharged in excellent health.

The casing of a Mauser bullet was removed from the neck of Private G., Inniskilling Fusiliers, on a level with the great cornu of the hyoid bone, just over the vessels on the left side.

In another man a bullet was removed from the left buttock, where it was giving rise to brawniness and a sinus persisted.

Only bullets which were causing inconvenience, or in which sinuses persisted, were operated on; the men in all other cases were recommended to let the bullets remain.

Operations on nerves.

There were five operations on nerves, all of which were successful; they all followed gunshot wounds.

Corporal H., 1st Yorkshire Regiment, had a Mauser bullet enter the inside of the middle of the left forearm, which emerged on the front of the outer side. He had paralysis and loss of sensation in the parts supplied by the median nerve. Median faradic irritability was diminished, whilst the ulnar was normal. An incision was made over the median nerve, which was found thickened but not divided. The nerve was dissected out, and then the wound stitched up. He went out on furlough improving.

Private G., Lancashire Fusiliers, had a gunshot wound which fractured the right humerus; the supinator longus and the common extensors had very nearly lost all faradic irritability. A.C.C. 7 K.C.C. sluggish; ulnar and median normal; the diagnosis was that the musculo-spiral was not completely divided. As he however had an open wound, this was opened up, and some pieces of necrosed bone taken away, and the musculo-spiral nerve was dissected out; it was found to be very much thickened, but perfectly continuous. There was much distortion of the bone pressing on and embedding the nerve. The groove in the humerus was very rugged. The faradic irritability of the extensors very much improved. He went out unfit three months after the operation, but distinctly improving.

Private T., Scots Fusiliers, was wounded at Pieter's Hill by a Mauser bullet, which grazed the back of the left wrist, and entered the outer side of the left biceps 2½ inches above the external condyle, and made its exit middle of the back of left upper arm. The wounds healed in a month. On arrival here, on the 4th July, 1900, he had drop wrist. On the 25th July an incision was made along the course of the musculo-spiral nerve, in the lower third of the arm, and the nerve found embedded in scar tissue. A bulbous enlargement was found on it where it perforated the external intermuscular septum. Primary union was obtained. Voluntary movement was obtained early in November, but still some impaired sensation on back of left hand. He was discharged fit for duty on the 21st November.

Private H., Queensland Mounted Infantry, was wounded near Pretoria on the 2nd September, 1900. The bullet entered over the middle of the right scapula, and emerged under the right clavicle. He suffered much pain in the finger distribution of the ulnar nerve. He was X-rayed, and there were seen two small pieces of lead in the axilla. On the 2nd November the ulnar nerve was cut down upon in the axilla, but no morbid condition was found; the nerve was stretched. The pain got better. After considerable use of massage and electricity he recovered complete use of the arm and hand, and went out fit for duty on the 10th May, 1901.

The remaining case was simply one of dividing the nerves in a painful stump.

Ligature of arteries.

The second part of the axillary artery and the popliteal artery were ligatured for aneurysms resulting from gunshot wounds.

Private S., Loyal North Lancashire Regiment, was wounded at Modder River on 28th November, 1899, by a Mauser bullet, which entered half-an-inch below the right patella, and came out in the popliteal space, passing through the knee-joint, with very little injury to it. The wounds healed almost at once, but eight days afterwards an aneurysm was noticed low down in the popliteal space. He came home on the 26th February, 1900; he then had a fairly large aneurysm. He was treated with chloride of calcium for some time without effect; he was also treated by flexion of the hip and knee-joints, and by pressure on the femoral; both of these methods were painful, and likewise unsuccessful. On the 19th June the popliteal

artery in its upper part was ligatured by an incision along the margin of the adductor magnus. Primary union took place, and on the twelfth day the stitches were removed from the incision. The tumour, which originally was as large as a small egg, was reduced to the size of a marble, but there was still a little expansile pulsation. This gradually decreased, and he went out on fit furlough on the 10th August. I have since heard from the man, stating that he is quite well.

Trooper H., Imperial Yeomanry, was wounded at Harrismith by a Mauser bullet, which entered the front and inner side of the left upper arm, and came out behind; the humerus was not injured. When he arrived home, on the 23rd February, 1901, he had a fairly large aneurysm of the third part of the axillary artery. On the 28th April a silk ligature was put on the proximal side of the tumour, which stopped pulsation. On the 9th May the stitches were taken out, and the aneurysm was found to be quite solid. On the 17th June, when he was finally discharged, a solid lump the size of a hazel nut was in the position where the aneurysm had been.

Laparotomy. There were two cases of laparotomy, one for malignant new growth, and the other for foreign body in the abdomen; the former died, and the latter recovered and went to duty.

Sergeant M., King's Royal Rifles, had suffered for a long time from pain in the right iliac region, dyspepsia, constipation, alternating with diarrhœa and gradually increasing debility. He attributed his condition to a previous attack of dysentery in India. On arrival home from South Africa, towards the end of 1900, he was very emaciated, suffered from intermittent attacks of pain, and had a swelling in the right iliac region extending up under the ribs. In the beginning of December the abdomen was opened over the tumour, when the right iliac and lumbar regions were found filled with a hard mass, which evidently originated behind the cæcum; the bowel was pushed in front and was inflamed. From the extent and situation of the tumour it was decided that it could not be removed; so the incision was sewn up. The wound healed by primary union, but the man sank from gradually increasing malignant cachexia, weakness and emaciation, and died on the 6th February, 1901. His bowels were never obstructed; unfortunately no post-mortem examination was permitted.

Private S., East Yorkshire Regiment, was operated on at Pretoria, on the 28th January 1901, for left inguinal hernia; about eight days afterwards a swelling began to appear in the left side; this gradually got larger, and he was invalided home, arriving here on the 18th May. On examination after arrival, there was seen the incision of the operation perfectly healed, and there was felt and seen a tumour, about the size of two closed fists, filling the whole of the left side of the abdomen, very hard, and with no sense of fluctuation. The man's general condition was good, there was no cachexia or rise of temperature. The diagnosis was some deep-seated inflammatory condition; but still it was thought that it might possibly be a sarcoma. On the 31st May an incision was made over the tumour, the muscular wall of the abdomen was cut through; then no peritoneum could be recognized; an aspirating needle was now put into the tumour, and pushed deeply, when a little pus was withdrawn. The tumour was now cut into; it was very hard, and no relations of abdominal contents were made out; when the incision had gone to the depth of about 3 inches, a small cavity was found with a little fluid in it. This being explored by the finger, a foreign body was felt, which was readily extracted by a pair of forceps. On examination this was seen to be eight silk stitchings interlocked, such as might be used for ligaturing off the omentum in sections, which no doubt was the case. They were covered with a caseating crumbling material. A drainage tube was put in and retained for forty-eight hours, and was then withdrawn. The wound healed up slowly but very surely, with very little discharge. The mass of thickening gradually disappeared, there never being a rise of temperature during the healing process. The man went out perfectly fit exactly three months after the operation, no trace of the tumour being left.

ation on ns. This was a case of division of the tendo achillis. The man was wounded at Pieter's Hill, on the 23rd February, 1900. A Mauser bullet entered the middle of the fold of the left buttock, and made its exit six inches directly

below the anterior superior spine of the left ilium. The femur was fractured, and the sciatic nerve was implicated, although the division of the nerve was incomplete. The tendo achillis had become contracted from spastic contraction of the muscles inserted into it. His condition greatly improved from the point of view of the nerve injury under massage and electricity, but his foot remained in a hyper-extended condition. After the division of the tendon he greatly improved, and soon was able to put his foot on the ground flat. He now can walk about very well, although lame.

Trephining of bone.

Private H., 1st Munster Fusiliers, on outpost duty at Grasspan on the 14th March, 1900, fell into a trench; he went to hospital a week afterwards as the knee commenced to swell. He was invalided home, with what was supposed to be sarcoma of the head of the right tibia, and arrived home on the 3rd June. On arrival the head of the tibia was found to be much enlarged, the man cachectic, and with nocturnal exacerbations of pain. The diagnosis was complicated by a history of syphilis. On the 30th June the head of the tibia, which was very indurated, was trephined, and a considerable amount of pus let out from the cancellous tissue; there was a fair sized abscess cavity. The intense pain was at once relieved; the abscess cavity granulated up, and the man went out fit on the 18th September. Only for one day after the operation was the temperature above normal. Staphylococci were found in the pus.

The second case was one in which, with a discharge from the ear, there was swelling over the mastoid. The cells were opened, and the case did well, but slowly.

Appendicitis

Five cases were operated on, four of which were cases of abscess. In the two successful cases the appendix was not found, but both healed up perfectly after operation, and the men had no recurrence of the disease. The partially successful case had been operated on in South Africa, and came home with a fæcal fistula. After he came home a huge abscess was opened in the right iliac region; he then got very well in health, but there is a large deficiency of the anterior wall of the cæcum, which could not be remedied by simple closure; an enterorraphy being considered the only possible operation, and to this the man was not willing to submit.

One of the cases which died was really successful so far as the operation for appendicitis was concerned. He was sent home for heart disease following on rheumatism, and on the passage home developed a swelling over the cæcum. On the 23rd February, 1901, an incision was made over the cæcum, and a large abscess was evacuated, with a very fæcal odour; this healed very slowly, but eventually did heal, but the man died of heart disease in August, cyanosis and pulmonary congestion coming on very suddenly.

The second case in which death took place followed after enteric fever, which he contracted in May, 1900, in South Africa. A swelling appeared in June, in the right iliac region, and pus was evacuated. He arrived home from South Africa at the end of July. He then had sinuses, and pus burrowing amongst the abdominal muscles, but also going down to the region of the cæcum. After arrival home, on two occasions collections of pus were evacuated, and free drainage established, but he never regained strength, and ultimately died of exhaustion.

Inguinal colotomy.

Private G., Royal Army Medical Corps, is stated to have had appendicitis in South Africa, in March, 1900, then he got enteric fever at Elands Laagte in April, and this was followed by dysentery. He arrived home on the 15th June, he complained of great pain, and was passing very little fæces. On examining the rectum, on the 23rd June, a stricture was found; which just admitted the tip of the finger, and was thought to be malignant. The man got worse, with great cachexia and very little passage; so on the 26th an incision was made in the left inguinal region, and 4 inches of the descending colon pulled out and stitched to the parietes. On the 30th the bowel was opened and a glass tube inserted. From this date the man commenced to improve, and put on flesh, and the stricture, which was supposed to be cancerous, softened, and almost disappeared. It was not, however, considered advisable to close the artificial anus, and he was sent out with a colotomy plug.

APPENDIX No. III.

ENTERIC FEVER AMONGST THE BRITISH TROOPS IN INDIA.

By Major T. McCulloch, M.B., Royal Army Medical Corps.

In dealing with this subject, it will be of interest to review briefly the history of the disease with regard to its occurrence among the British troops serving in India.

2. A well known observer, Dr. Morehead, in his "Researches on the Diseases of India," 1856, Volume I, page 307, states "that typhus and typhoid fevers are unknown in India," although in the same volume he records two or three cases of fever which showed characteristic enteric ulceration.

3. A paper on "Typhoid Fever in India from a Sanitary Point of View," by Surgeon W. Hanbury, 33rd Foot, was published in the Army Medical Department Report for 1861, in which a most accurate description, clinical and pathological, is given of six cases of enteric fever which occurred at Deesa in 1859, and in the same paper attention is also drawn to two cases of fever attended with ulceration of Peyer's glands, which came under the notice of Dr. Hunter, 2nd Queen's Regiment, at Deesa, in 1841–42. The cases described by Surgeon Hanbury were probably the first cases in which typhoid or, as it is now called, enteric fever was diagnosed among British troops in India. In his introductory remarks to the paper the writer states :—"As the interest of the disease rests mainly on the morbid changes disclosed after death, and the clinical history and character of the affection can be fully exhibited in the description of the fatal cases, I shall refer to these only. The identity of the subject will thus be preserved, and no doubt will arise as to the real matter under consideration ; but it will be readily understood (though we do not affect to diagnose them) that a large number of cases of fever, which at this time terminated in recovery, presented symptoms greatly resembling those which characterized the cases selected for observation." And in the remarks, which follow the description of the six fatal cases, adds :—"And taking the direct and corroborative proofs of the existence of typhoid fever at what I conceive to be their legitimate value, I am not only of opinion that its identity is fairly established in the history of the cases, but that the disease may have hitherto escaped detection in many instances in this country, simply because the lesions characteristic of it were not sought for nor expected."

4. As far as the year 1870, the only evidence of the occurrence of cases of typhoid fever among the British troops in India, which can be found in official records, is the return of a small but annually increasing number of cases observed in the Bengal Command. There is abundant evidence, however, in the annual departmental reports, to show that the disease was also present in the other commands, and that many cases, classified under the heading of continued fevers, were in reality unrecognized instances of typhoid fever. Thus, we find it reported in 1867, that although continued fevers were not the cause of much sickness, yet they gave rise to an unusually high ratio of deaths in the Mhow Division, confined chiefly to the 11th Hussars at Mhow, and the 2nd Battalion, 1st Regiment, at Nasirabad. The former corps had 16 cases, of which 6 died ; and the latter 25 cases with 12 deaths. The cases in the 1st Regiment occurred chiefly in May, June and July, and in the 11th Hussars in August and September. In 1869, it is stated that the admissions for continued fevers were high in the Hyderabad and Rangoon circles, and the mortality in the former was considerably above the average. In the Hyderabad circle, 158 cases of continued fever were admitted from the 2nd Battalion, 24th Regiment, of which 8 terminated fatally, 7 of enteric and 1 of typhus fever. It is worth

noting that this is the first report in which the designation "enteric" appears. Again, in the Army Medical Department Report for 1870, we find it stated that continued fevers were much above the average in the Peshawar, Jhelum, Lahore and Saugor divisions, and the mortality from them was very high in the Oudh, Peshawar, Lahore and Jhelum divisions. In the Oudh division, the excess was in the 1st Battalion, 17th Regiment, at Lucknow, in which these fevers prevailed from May till September, and were very fatal, 13 deaths having occurred during that period, of which 9 were in May. In his report for 1871, the Principal Medical Officer of the Bengal Command, under the heading of continued fevers, made the following remarks with reference to fevers of enteric type:—"This form of fever has apparently increased much in frequency and mortality during the past four years, but it may be a question whether this is not rather a result of more careful study and diagnosis than of any actual increase of the disease in the Command." In the same report it is stated that the stations at which enteric fever was most prevalent and fatal during the year were Peshawar, Cherat, Hazareebagh, Lucknow, Meerut, Agra, Allahabad, Shahjahanpur and Umballa.

5. In the Army Medical Department Report for 1872, the following table is given, showing the admissions and deaths from enteric fever in the Bengal Command for the eleven years 1862 to 1872:—

Year.	Admissions.	Deaths.	Year.	Admissions.	Deaths.
1862	10	6	1868	70	40
1863	20	13	1869	61	27
1864	9	5	1870	89	38
1865	13	8	1871	131	48
1866	14	9	1872	104	51
1867	16	8			

6. In 1871, the Bombay Command returned 22 cases with 14 deaths, and the Madras Command 15 deaths (admissions not given). In the following year, there were 79 admissions with 26 deaths recorded for the Madras Command, and 42 admissions with 25 deaths for the Bombay Command, making a total of 225 enteric fever cases in India for 1872 with 102 deaths. From 1872, regular records are given for the three Commands, but up to the year 1882 the disease was included in the statistical returns under the heading of "continued fevers."

7. In the Army Medical Department Report for 1872, the difficulties of diagnosis, between the slighter cases of enteric fever and simple or malarious fever attended with gastric irritability and intestinal disturbance, are referred to as so great, that a considerable proportion of the former always escape recognition; and it is added, that the apparently much more fatal character of enteric fever in India, as compared with Europe, is no doubt attributable in a great measure to this cause. The high death rate from enteric fever is again referred to in 1881, and the opinion is stated (Army Medical Department Report, 1881, page 66), that the great mortality, nearly 43 per cent. of the cases treated, is sufficient evidence that the real prevalence of the disease has been understated.

8. For 1874, the Principal Medical Officer, Bengal Command, considered it probable that many cases of enteric fever were returned under other heads, and, after giving numerous extracts from the regimental reports for the year in support of this view, he summed up as follows:—"It will be apparent that the extracts from the reports in 1874 afford strong grounds for suspecting that enteric fever prevailed in the Bengal Command to an extent

far exceeding that for which there is statistical evidence." For the same year, the Principal Medical Officer, Bombay Command, also gave somewhat similar extracts in his report, and stated "that the number of admissions returned is not the measure of the prevalence of enteric fever in the Bombay Command."

9. In 1878, we find it recorded that cases of enteric fever occurred in every division of the Bengal Command, and indeed, at nearly every station, but it was most prevalent at Lucknow, Bareilly, Agra, Umballa, Morar, Meerut and Subathu, and that it occurred chiefly in the second and third quarters of the year, which contributed more than three-fourths of the total number of cases. It would thus appear that the hot and monsoon months were the special seasons for its prevalence, and the influence of "youth" and "recent arrival in the country" were stated to be as usual the most remarkable factors in conducing to susceptibility to the disease.

10. That enteric fever was no new and fatal disease introduced into the country is shown by the cases of fever already referred to as having been observed at Deesa in 1841 and 1859, and by the fact that, as soon as attention was called to the disease, cases began to be regularly recorded. Again, when the statistics of the mortality from all forms of fever are examined, no material increase in the fever death rate is observed for the earlier years of enteric return; and in a paper on enteric fever by Surgeon-General J. H. Ker Innes, C.B., in the Army Medical Department Report, 1878, it is stated that the then statistical officer with the Government of India, Dr. Bryden, had pointed out "the very significant fact that the ratio of fever mortality (in the gross) of past years, if taken in relation to months and newly arrived regiments, is nearly absolutely identical with that of enteric fever at the present time (1877). The statistical indication, therefore, is that the only change, to begin with at any rate, was one of diagnosis, the enteric cases having been previously returned as simple continued or malarial fevers. In those days very diverse opinions existed as to the exact nature of the disease, some regarding it as malarial in its origin, others as a combination of typhoid and malarial, and others, again, as specifically the same disease as the enteric fever of Europe.

11. The specific germ, the *bacillus typhosus*, was first described by Eberth in 1880, and in 1884 Gaffky's researches established the fact that it bore a causal relation to the disease. Since then the teaching of experience has been that the enteric fever of India is specifically the same as that of Europe, but more fatal in character, and in many instances modified in its course by malarial and climatic conditions.

12. Continued observation resulted in a steadily increasing number of cases being separated from the category of malarial and continued fevers and classified as enteric, and change of diagnosis explains the greater part of the increase observed between 1872 and 1883. But although there was a decrease in the deaths from fevers other than enteric in the earlier part of that period, yet, towards its close, there was also a slow but steady increase in the death rate from all fevers combined, which argues that enteric fever, as well as being better recognized, was also slowly spreading and slowly becoming more prevalent. It may be of interest to mention here, on the authority of Dr. Bryden, that out of 73 regiments and batteries which came to India between 1871 and 1877, nine only remained free from enteric fever in the first twelve months after landing.

*Enteric fever amongst the European troops in India, 1862 to 1878.**

Year.	Bengal.		Bombay.		Madras.	
	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
1862	10	6				
1863	20	13				
1864	9	5				
1865	13	8				
1866	14	9				
1867	16	8				
1868	70	40				
1869	61	27				
1870	89	33				
1871	131	48	22	14	—	15
1872	104	51	42	25	79	26
1873	143	54	17	—	52	10
1874	168	71	33	—	34	12
1875	111	57	40	17	23	7
1876	178	65	44	17	51	20
1877	142	53	22	15	65	22
1878	409	167	47	25	7	5

13. Study of the statistical returns shows that the increase in the prevalence of enteric fever began to be pronounced between 1883 and 1888, and that in the next ten years, 1889 to 1898, the increase of prevalence was steady and rapid. It is, however, very satisfactory to observe that there was a large decrease in both enteric prevalence and mortality during 1899 and 1900; and it may be here pointed out, that, since the publication of Widal's test in 1896, bacteriological methods (agglutination and sedimentation tests) have been added to our resources in the diagnosis of enteric fever and have been freely utilized in the differentiation of atpyical fever cases.

14. The following table contrasts the decennial averages for the period 1879 to 1888 with the corresponding averages for the ten years 1889 to 1898 :—

—	Decennial averages for Enteric Fever.				
	Admissions.	Deaths.	Ratio per 1,000.		Percentage of mortality to attack.
			Admissions.	Deaths.	
1879-88 ..	584	184	9·8	3·14	31·5
1889-98 ..	1,632	432	24·1	6·38	26·4

It will be observed that the average admission ratio was considerably more than doubled in the ten years 1889-98, and that the average death rate for the same period is almost exactly twice what it was for the decennial period 1879-88.

15. The admission ratio first exceeded 10 per 1,000 in 1884, in which year it had risen to 11·7 with a death rate of 2·73 as compared with 7·6 and 2·30,

* Figures for 1879 to 1900 are given on next page.

Enteric fever amongst European Troops in India, 1879 to 1900.

Year.	Bengal.				Bombay.				Madras.				Total.			
	Admissions.	Deaths.	Ratio per 1,000.		Admissions.	Deaths.	Ratio per 1,000.		Admissions.	Deaths.	Ratio per 1,000.		Admissions.	Deaths.	Ratio per 1,000.	
			Admissions.	Deaths.			Admissions.	Deaths.			Admissions.	Deaths.			Admissions.	Deaths.
1879 ...	263	117	9·0	4·02	28	17	2·8	1·72	12	10	1·1	·95	303	144	6·1	2·91
1880 ...	253	95	8·3	3·10	53	33	5·8	3·59	25	11	2·4	1·07	331	139	6·6	2·77
1881 ...	249	107	6·5	2·80	31	19	3·4	1·90	9	5	·9	·48	292	131	5·0	2·24
1882 ...	268	103	7·4	2·83	43	18	4·2	1·77	47	23	4·4	2·13	358	144	6·2	2·51
1883 ...	274	84	8·0	2·44	60	16	5·4	1·43	94	29	8·8	2·73	428	129	7·6	2·30
1884 ...	423	111	12·5	3·29	97	22	9·0	2·05	129	18	11·9	1·66	649	151	11·7	2·73
1885 ...	486	142	13·8	4·05	88	30	7·6	2·57	73	23	7·0	2·21	647	195	11·3	3·41
1886 ...	820	222	20·7	5·61	134	46	12·2	4·18	139	44	12·4	3·93	1,093	312	17·7	5·05
1887 ...	538	166	13·1	4·06	127	38	11·3	3·37	144	35	12·3	2·98	849	239	12·7	3·74
1888 ...	686	177	16·3	4·20	137	48	11·5	4·02	104	32	7·4	2·27	927	257	13·6	3·77
1889 ...	1,093	283	26·0	6·72	257	76	19·9	5·89	221	61	16·3	4·50	1,571	420	22·9	6·13
1890 ...	996	259	24·2	6·30	131	24	10·3	1·88	126	49	9·3	3·62	1,253	332	18·6	4·92
1891 ...	998	268	24·8	6·67	204	71	16·0	5·58	141	41	10·6	3·09	1,343	380	20·3	5·74
1892 ...	1,130	270	26·8	6·40	222	64	17·4	5·04	154	40	11·7	3·03	1,506	374	22·1	5·50
1893 ...	1,076	276	25·0	6·42	173	50	12·8	3·70	153	44	11·5	3·30	1,402	370	20·1	5·30
1894 ...	1,069	300	24·2	6·79	277	69	20·7	5·14	138	39	10·3	2·91	1,484	408	20·9	5·75
Bengal	674	169	30·3	7·59	...	...	...	...	...	...	...	...	...	...	..	...
Punjab	444	109	26·1	6·40	...	...	...	...	...	...	...	...	...	...	...	...
1895...	1,118	278	28·5	7·08	255	70	16·3	4·48	171	35	12·7	2·61	1,544	383	22·6	5·61
Bengal	679	173	30·2	7·70	...	...	...	...	...	...	...	...	...	...	...	...
Punjab	488	115	25·9	6·11	...	...	...	...	...	...	...	...	...	...	...	...
1896...	1,167	288	28·3	6·98	401	100	25·5	6·36	227	57	16·8	4·23	1,795	445	25·5	6·31
Bengal	786	209	39·1	10·39	...	...	...	...	...	...	...	...	...	...	...	...
Punjab	724	180	42·1	11·05	...	...	...	...	...	...	...	...	...	...	...	...
1897...	1,510	399	40·5	10·70	303	96	20·4	6·46	237	61	19·2	4·93	2,050	556	31·8	8·62
Bengal	824*	210	41·1	10·47	...	...	...	...	...	...	...	...	...	...	...	...
Punjab	895	271	48·7	14·74	...	...	...	...	...	...	...	...	...	...	...	...
1898...	1,719	481	44·7	12·51	513	145	35·3	9·98	143*	28	11·6	2·28	2,375	654	36·3	10·0
Bengal	435*	117	22·8	6·50	...	...	...	...	...	...	...	...	...	...	...	...
Punjab	451*	120	24·9	6·64	...	...	...	...	...	...	...	...	...	...	...	...
1899...	936	237	23·8	6·07	300*	72	19·4	4·66	156	39	12·1	3·04	1,392	348	20·6	5·14
Bengal	243*	69	12·8	3·64	...	..	...	...	...	...	...	...	...	...	...	...
Punjab	256	72	15·9	4·46	...	...	...	...	...	...	...	...	...	...	...	...
1900...	499	141	14·3	4·05	351*	101	23·5	6·72	117	47	12·0	4·83	970	289	16·0	4·77

* Includes cases (one or more) occurring among troops marching.

the corresponding ratios for the preceding year. From 1884 the admission and mortality rates steadily increased, until seven years later the admission rate had risen to be regularly over 20 per 1,000, and the death rate to regularly exceed 5 per 1,000.

16. From 1891 to 1895, the admission rate varied between 20·3 per 1,000 in 1891 to 22·6 in 1895, there being therefore but little change during those years in the extent of the prevalence of the disease; while for the same period the death rate also remained almost unchanged, being lowest, 5·30 per 1,000, in 1893, and highest, 5·75, in 1894.

17. The next three years, 1896-98, are remarkable as being years of exceptional increase in the prevalence of enteric fever :—

—	Admissions.	Deaths.	Ratio per 1,000.		Percentage of mortality to attack.
			Admissions.	Deaths.	
1896	1,795	445	25·5	6·31	24·8
1897	2,050	556	31·8	8·62	27·1
1898	2,375	654	36·3	10·00	27·5

18. In 1896 the increase was general, but greatest in the Bombay Command, as the result of epidemic outbreaks at Quetta (140 cases with 22 deaths) and at Mhow (70 cases with 9 deaths). The increase in the Madras Command was due to the prevalence of the disease at Secunderabad (96 cases with 18 deaths), and Bangalore (47 cases with 16 deaths). In the Bengal and Punjab Commands, the greatest prevalence was at Subathu (109 cases with 15 deaths), Allahabad (97 cases with 29 deaths), Ranikhet (75 cases with 11 deaths), and Peshawar (72 cases with 17 deaths).

19. In 1897, the stations showing the greatest prevalence were Agra (181 cases with 49 deaths), Umballa (138 cases with 33 deaths), Lucknow (120 cases with 30 deaths), Meerut (97 cases with 38 deaths), Secunderabad (95 cases with 23 deaths), Rawal Pindi (95 cases with 23 deaths), Peshawar (87 cases, not including 20 cases transferred from Jamrud and Hari Singh-ka Burj, the total deaths being 53), Mhow (81 cases with 28 deaths), Cherat (80 cases with 21 deaths), Dagshai (76 cases with 7 deaths), and Bangalore (67 cases with 12 deaths). It will be observed that for this year the largest sources of increase occurred in Bengal and Punjab stations.

20. In 1898, the greatest increase was in the Bombay Command (Quetta epidemic), while the increases of 1897 in Bengal and the Punjab were still further increased, but a notable decrease was observed in the Madras Command.

The largest outbreaks were as follows :—

Khyber Force	238	cases	with	60	deaths.		
Quetta	232	„		75	„		
Lucknow	174	„		53	„		
Rawal Pindi	123	„		26	„		
Peshawar	102	„		48	„		
Agra	88	„		20	„		
Meerut	78	„		19	„		
Mhow....	76	„		20	„		
Chakrata	72	„		7	„		
Umballa	67	„		25	„		
Bangalore	57	„		8	„		

21. The following are the statistics of enteric prevalence and mortality r the years 1899 and 1900 :—

—	Admissions.	Deaths.	Ratio per 1,000.		Percentage of mortality to attack.
			Admissions.	Deaths.	
1899	1,392	348	20·6	5·14	25·0
1900	970	289	16·0	4·77	29·8

When the figures for 1899 are compared with the statistics of preceding years, it is observed that no year since 1893 has a lower admission ratio, and no year since 1890 a lower death rate; while both the admission and mortality ratios for 1900 are lower than for any year since 1888, in which year the admission rate was 13·6 and the death rate 3·77 per 1,000.

22. In 1899, the disease prevailed most in the Punjab, Bengal and Bombay Commands, but all three show largely decreased admission and death rates; while for the Madras Command the admission and mortality ratios both show a small increase as compared with the preceding year.

The largest outbreaks were as follows :—

Rawal Pindi	99 cases with	19	deaths.
Lucknow	82 „	22	„
Chakrata	74 „	10	„
Bangalore	59 „	12	„
Umballa	57 „	16	„
Ahmednagar	55 „	9	„
Mhow	49 „	14	„
Secunderabad	48 „	9	„
Meerut	45 „	17	„
Nasirabad	42 „	10	„
Peshawar	41 „	16	„

23. In 1900, the greatest prevalence was in the Bombay Command, chiefly the result of a large outbreak of enteric fever at Quetta. The Punjab and Bengal Commands show a further progressive decrease of enteric prevalence as compared with 1899, and investigation shows that the decrease in both Commands was a general one. and not confined to particular stations. The admission ratio for the Madras Command was almost the same as that for the preceding year, 12·0 as compared with 12·1, but the mortality ratio shows increase, 4·83 against 3·04; the maintenance of the Command admission ratio and the increase in the death rate were caused by the occurrence of an outbreak of enteric fever of severe type at Secunderabad.

The largest outbreaks were as follows :—

Quetta	129 cases with	29	deaths.
Secunderabad	77 „	25	„
Lucknow	63 „	15	„
Rawal Pindi	59 „	12	„
Nasirabad	56 „	21	„
Poona	43 „	16	„
Mhow	35 „	6	„
Peshawar	29 „	15	„
Ahmednagar	22 „	5	„
Umballa	21 „	6	„

Prevalence in Commands.

24. Up to 1894, the figures for the Punjab were included in the returns for the Bengal Command, and in 1895, Quetta was transferred to the Bombay Command, whereas its returns were previously included with those for Bengal.

25. Enteric fever has always been much more prevalent in Bengal and the Punjab than in either Bombay or Madras, and increase of prevalence has followed in the same order.

26. Taking the statistics for the fifteen years 1884–98, the years in which there was steady and progressive increase in the prevalence of the disease, and dividing the time into three quinquennial periods, the average admission and death ratios are contrasted in the following table to show the relative increase of enteric fever in the different Commands:—

Period.	Bengal, including Punjab.		Bombay.		Madras.	
	Ratio per 1,000.		Ratio per 1,000.		Ratio per 1,000.	
	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
1884–88 ..	15·3	4·24	10·3	3·24	10·2	2·61
1889–93 ..	25·3	6·50	15·3	4·41	11·9	3·50
1894–98 ..	33·2	9·81	23·6	6·47	14·1	3·39

27. *Madras Command.*—Comparatively little increase of prevalence is shown during the fifteen years. The increase in the last period was caused by epidemic outbreaks at Secunderabad in 1896 and 1897. The admission and death ratios for 1898 were 11·6 and 2·28 respectively, showing a very satisfactory decrease.

The admission and mortality ratios for 1899 and 1900 show comparatively little change either for better or worse. Although always much less prevalent in this Command than elsewhere in India, yet enteric fever continues to appear year by year with great persistency in the two largest stations, Secunderabad and Bangalore. In 1900, a severe outbreak occurred at Secunderabad, while Bangalore was exceptionally free from the disease.

28. *Bombay Command.*—This Command shows steady increase. Part of the large increase shown during the five years 1894–98 was caused by the transfer of Quetta from the Bengal Command, there having been two large enteric fever epidemics at Quetta during this period—one in 1896, and the other in 1898. The 1898 outbreak was the chief cause of the admission ratio for the Command rising to the high figure of 35·3 per 1,000 for that year.

The Command admission ratio fell to 19·4 per 1,000 for 1899, but rose again to 23·5 in 1900, for which an epidemic at Quetta is again chiefly responsible, although the rise in the ratio was also materially contributed to by the prevalence of enteric fever at Nasirabad, Poona and Mhow.

29. *Bengal and Punjab Commands.*—The returns for the two Commands have been recorded separately since 1895, in which year the admission and death ratios for enteric fever in the Bengal Command were 30·3 and 7·59 per 1,000 respectively, as compared with 26·1 and 6·40, the corresponding ratios for the Punjab Command. The figures for both Commands were almost unchanged for 1896, but the next two years show an extraordinary increase of enteric fever in both Commands, but particularly in the Punjab.

Year.	Bengal.		Punjab.	
	Ratio per 1,000.		Ratio per 1,000.	
	Admissions.	Deaths.	Admissions.	Deaths.
1896	30·2	7·70	25·9	6·11
1897	39·1	10·39	42·1	11·05
1898	41·1	10·47	48·7	14·74
1899	22·8	5·50	24·9	6·64
1900	12·8	3·64	15·9	4·46

The stations at which the disease was most prevalent in 1897–98 have already been given. A large part of the Punjab increase was, doubtless, the result of field service during the North-West Frontier operations, and another large source of increase was the epidemic among the troops garrisoning the Khyber in 1898.

30. If the increase of enteric fever in 1897–98 among the troops stationed in the Punjab and Bengal was extraordinary, the decrease of the disease in 1899–1900 in both Commands is equally remarkable. Roughly speaking, in both instances the admission and mortality ratios for 1900 are only one-third of the corresponding ratios for 1898. It is also important to note that by far the greatest part of the diminution in the prevalence of enteric fever in India during 1899–1900 occurred in the Punjab and Bengal Commands. No positive assertions can be made with regard to the causation of the decrease. It was probably the result of a combination of circumstances. (1) Many improvements have been carried out in connection with the general sanitation of barracks, water supplies and sewage disposal. (2) There was an absence of the usual influx of specially susceptible individuals, owing to the suspension of the ordinary reliefs. (3) Inoculations with anti-typhoid vaccine. (4) Continued absence of field service, in the train of which enteric always follows.

Prevalence in Stations.

31. The following table shows the stations in which enteric fever was most prevalent during the last ten years, 1891–1900, the admission ratio per 1,000 of strength being used as the basis of arrangement.

Plains Stations.	1891–1895.			1896–1900.			1891–1900.			
	Admissions.	Deaths.	Percentage of mortality to attack.	Admissions.	Deaths.	Percentage of mortality to attack.	Total admissions.	Total deaths.	Ratios per 1,000 admissions.	Percentage of mortality to attack.
1. Benares	100	17	17·0	15	21	18·3	215	38	54·7	17·6
2. Agra	172	47	27·3	37	98	26·4	543	145	46·3	26·7
3. Lucknow	472	104	22·0	496	141	28·4	968	245	40·0	25·3
4. Anmednagar	107	26	24·3	16	32	19·9	268	58	38·2	21·6
5. Nasirabad	102	30	29·4	80	66	36·7	282	96	37·4	34·0
6. Allahabad	123	17	13·8	228	75	32·9	351	92	36·6	26·2
7. Meerut	355	99	28·0	304	99	32·5	659	198	34·8	30·0
8. Umballa	300	79	26·3	332	94	28·3	632	173	33·1	27·3

Plains Stations.	1891-1895.			1896 1900.			1891-1900.			
	Admissions.	Deaths.	Percentage of mortality to attack.	Admissions.	Deaths.	Percentage of mortality to attack.	Total admissions.	Total deaths.	Ratios per 1,000 admissions.	Percentage of mortality to attack.
9. Quetta	172	31	18·0	579	142	24·5	751	173	33·0	23·0
10. Jubbulpore	119	29	24·4	126	32	25·4	245	61	32·1	24·9
11. Peshawar	203	83	40·9	331	149	45·0	534	232	31·7	43·4
12. Mhow	212	49	23·1	311	77	24·7	523	126	30·9	24·0
13. Kirkee	94	21	22·3	131	33	25·2	225	54	29·5	24·0
14. Rawal Pindi	383	116	30·2	412	95	23·0	795	211	29·2	26·5
15. Campbellpore	41	8	19·5	34	9	26·4	75	17	22·1	22·7
16. Muttra	38	9	23·7	79	25	31·6	117	34	29·0	29·0
17. Barrackpore	19	5	26·4	71	7	0·8	90	12	28·1	13·3
18. Fort Lahore	5	3	60·0	21	8	38·1	26	11	27·4	42·3
19. Bareilly	224	46	20·5	111	30	27·0	335	76	27·2	22·7
20. Nowshera	93	31	33·4	69	22	31·8	162	53	25·7	32·7
21. Mian Mir	107	31	29·0	122	24	19·7	229	55	25·4	24·0
22. Ahmedabad	51	14	27·4	6	5	83·3	57	19	24·4	33·3
23. Secunderabad	283	65	23·6	353	85	24·0	636	151	24·2	23·7
24. Deesa	43	9	21·0	39	14	35·9	82	23	22·8	28·0
25. Bangalore	175	30	17·1	235	49	20·8	410	79	22·7	19·2
26. Sialkote	189	38	20·1	67	15	37·3	256	53	22·6	24·6
27. Jullundur	65	25	38·4	89	24	26·9	154	49	20·8	31·8
28. Cawnpore	88	25	28·4	76	16	21·0	164	41	20·3	25·0
29. Poona	203	69	33·9	177	46	25·9	380	115	18·9	30·2
Hill Stations.										
1. Subathu	133	17	12·8	194	28	14·4	327	45	69·0	13·7
2. Cherat	132	41	31·0	154	36	23·4	286	77	61·9	26·9
3. Dagshai	243	42	17·3	143	23	16·1	386	65	58·4	16·8
4. Chakrata	148	37	25·0	221	24	10·8	369	61	36·8	16·5
5. Jutogh	38	8	21·0	39	5	15·4	77	13	34·2	16·9
6. Ranikhet	100	18	18·0	193	31	16·1	293	49	30·9	16·7
7. Dalhousie	96	37	38·5	92	20	21·7	188	57	24·9	30·3

It will be observed that the stations which had the largest number of admissions during the ten years were Lucknow (968), Rawal Pindi (795), Quetta (751), Meerut (659), Secunderabad (636), Umballa (632), Agra (543), Peshawar (534), Mhow (523), Bangalore (410), Poona (380), Allahabad (351), and Bareilly (335); and among the hill stations, Dagshai (386), Chakrata (369), Subathu (327), Ranikhet (293), and Cherat (286).

32. *Percentage of mortality to attack.*—The mortality from enteric fever in India is high. The total number of admissions for the disease during the ten years 1891-1900 was 15,861 with 4,207 deaths, or a mortality of 26·5 per cent., which is equivalent to 1 death in 3·77 cases. In 1900, although there was a large decrease in the admission rate, still the percentage of mortality to attack reached the high figure of 29·8. Peshawar, which stands eleventh on the list with regard to prevalence, has the highest percentage of mortality for the decennial period, 43·4 per cent, equivalent to 1 death in 2·3 cases. The hill stations garrisoned by healthy troops only all show much lower mortality percentages than those relating to plains stations; Cherat, the hill station for Peshawar, being the only one which shows a relatively high percentage of mortality (26·9). Dalhousie, which had 30·3 per cent. of its cases prove fatal, is one of the twelve sanitaria for convalescents.

33. The compilation of the following table, showing the statistics of enteric fever from 1895 to 1900 according to its prevalence among the different arms of the service, was suggested by observing that the disease was regularly more prevalent in some stations among the cavalry than among the infantry. For instance, at Mhow, the same cavalry regiment has occupied the cavalry barracks for the last five years, and with unfailing regularity enteric fever has been more prevalent in this regiment than in the infantry regiment of the station. The water, milk and food supplies are the same for the whole garrison, and apparently the only very marked

Table showing the admissions and deaths from Enteric Fever amongst the British

Arms of Service.	1895.					1896.					1897.			
	Strength.	Cases of Enteric Fever.		Ratio per 1,000.		Strength.	Cases of Enteric Fever.		Ratio per 1,000.		Strength.	Cases of Enteric Fever.		
		Admitted.	Died.	Admissions.	Deaths.		Admitted.	Died.	Admissions.	Deaths.		Admitted.	Died.	Admissions.
Cavalry	5,439	150	40	27·6	7·35	5,402	143	34	26·5	6·29	5,122	278	79	54·
Royal Horse Artillery, Royal Field Artillery and Royal Mountain Artillery.	8,711	220	50	25·3	5·74	8,908	236	59	26·8	6·70	8,496	298	87	35·
7 Eastern Division, Royal Garrison Artillery.	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12 Eastern Division, Royal Garrison Artillery.	89	1	..	11·2	..	86	2	1	23·3	11·63	90	4	1	44·
24 Southern Division, Royal Garrison Artillery.	83	1	..	12·0	..	89	1	..	11·2	..	90	..	..	..
7 Western Division, Royal Garrison Artillery.	94	3	1	31·9	10·64	95	3	..	31·6	..	91	4	2	44·
9 Western Division, Royal Garrison Artillery.	95	7	..	73·7	..	89	3	..	33·7	..	84	4	1	47·
Total Heavy Batteries.	361	12	1	33·2	2·77	359	9	1	25·1	2·79	355	12	4	33·
Royal Garrison Artillery, excluding Mountain and Heavy Batteries.	2,902	36	10	12·4	3·45	2,995	62	13	20·7	4·34	3,009	59	9	19·
Total Artillery ..	11,974	268	61	22·4	5·09	12,162	307	73	25·2	6·00	11,860	369	100	31·
Infantry ..	47,335	1,116	277	23·6	5·85	49,191	1,338	336	27·2	6·83	43,715	1,397	377	32·

by the different arms of the service from 1895 to 1900 with the ratios per 1,000 of strength.

1898.					1899.					1900.					Total.				
Strength.	Cases of Enteric Fever.		Ratio per 1,000.		Strength.	Cases of Enteric Fever.		Ratio per 1,000.		Strength.	Cases of Enteric Fever.		Ratio per 1,000.		Strength.	Cases of Enteric Fever.		Ratio per 1,000.	
	Admitted.	Died.	Admissions.	Deaths.		Admitted.	Died.	Admissions.	Deaths.		Admitted.	Died.	Admissions.	Deaths.		Admitted.	Died.	Admissions.	Deaths.
4,855	263	58	54·2	11·95	4,587	209	55	45·6	11·99	2,603	94	24	36·1	9·22	28,008	1,137	290	40·6	10·35
8,282	277	80	33·4	9·66	8,366	248	68	29·8	8·16	7,061	101	31	14·3	4·39	49,694	1,380	375	27·8	7·55
..	..	..	..	..	14	..	..	..	..	82	2	1	24·4	12·20	96	2	1	20·8	10·42
91	5	1	54·9	10·99	74	3	1	40·5	13·51	..	..	..	..	..	430	15	4	34·9	9·30
71	2	1	28·2	14·08	75	1	1	13·3	13·33	85	2	1	23·5	11·76	493	7	3	14·2	6·09
80	1	..	12·5	..	91	4	..	44·0	..	81	3	1	37·0	12·35	532	18	4	33·8	7·52
79	1	..	12·7	..	87	..	..	..	..	86	2	..	23·3	..	520	17	1	32·7	1·92
321	9	2	28·0	6·23	341	8	2	23·5	5·87	314	9	3	26·9	8·98	2,071	59	13	28·5	6·28
2,989	74	27	25·6	9·35	3,007	20	7	6·7	2·33	2,894	22	5	7·6	1·73	17,696	273	71	15·4	4·01
11,492	360	109	31·3	9·48	11,684	276	77	23·6	6·59	10,289	132	39	12·8	3·79	69,461	1,712	459	24·6	6·61
44,812	1,690	455	37·7	10·15	47,444	804	215	19·1	4·53	43,560	740	222	17·0	5·10	276,037	7,185	1,913	26·0	6·93

differences in the surroundings of the two barracks are, that the cavalry barracks are nearer the bazar, and that there is a native village at no great distance.

Munson also points out* the much greater prevalence of enteric fever amongst the cavalry of the United States troops. He states that "for the period 1867-83, inclusive, the admission rates per 1,000 of strength were as follows: cavalry, 19; infantry, 4·6; artillery, 2·5. For this sixteen-year period, the cavalry thus suffered more than seven times as much from typhoid as did the artillery and nearly five times as much as the infantry, while its death rate was more than three times greater than either of the others. This great difference was largely due to the active field service against Indians required of mounted troops. For the seven-year period 1890-96 the admission rates per 1,000 of strength were 8·03 for the cavalry, 5·74 for the infantry and 4·74 for the artillery. In time of peace, the Medical Department is affected less than any of the above arms of the service; during the war with Spain it suffered more than twice as much as any of them."

34. The foregoing table shows that the admission ratio among the cavalry for the six years was 40·6 per 1,000, as compared with 26·0 for the infantry, and 24·6 for the artillery. Further it will be observed that the disease was most prevalent among cavalry soldiers for each of the years except 1896, in which year the infantry admission ratio was a little higher than that for the cavalry, 27·2 against 26·8.

35. The figures for the artillery, as a whole, occupy a position intermediate between those for the cavalry and the infantry, but are much nearer infantry than cavalry figures. The artillery statistics have been split up in order to show the difference in the enteric prevalence in the mounted and dismounted branches, and the figures are arranged in three groups:—

1. Horse, field and mountain batteries are grouped together, as they closely approximate cavalry in their conditions of life.
2. The four garrison companies employed as heavy batteries are grouped separately, as the men have also to deal with animals (bullocks and elephants) in their daily work.
3. Garrison artillery companies (excluding mountain and heavy batteries) —men living under infantry conditions.

36. The analysis of the ratios thus obtained is of great interest. Dealing with the total statistics for the six years, we find that the heavy batteries had the highest admission ratio, 28·5 per 1,000, which is followed by 27·8 for the horse, field and mountain battery group; and it should be observed that these ratios are much lower than that for the cavalry. The ratio for the garrison artillery works out 15·4 per 1,000, which, in its turn, is lower than 26·0, the infantry ratio. There are two points of interest here,—first, enteric fever was only about half as prevalent in the garrison as compared with the other branches of the artillery; second, the disease was less prevalent among horse, field, mountain and heavy batteries than among cavalry, and among ordinary garrison artillery than among infantry. With regard to the second point, the explanation may be, that the artillery get men of better physique, and that they probably have a larger proportion of older men in the ranks than is the case in cavalry and infantry regiments.

37. The difference of prevalence of enteric fever in the different arms of the service during the six years 1895 to 1900 may be shown thus:—

	Ratio per 1,000 of Strength.	
	Admissions.	Deaths.
Cavalry	40·6	10·35
Artillery .. { Heavy batteries	28·5	6·28
Artillery .. { Horse, field and mountain ..	27·8	7·55
Infantry	26·0	6·93
Artillery, Garrison	15·4	4·01

* *Military Hygiene*, p. 690.

I can offer no satisfactory explanation of these figures, but direct attention to the statistical fact of the greater prevalence of enteric fever in the branches of the service in which the men are brought into daily contact with animals, as one which, to my mind, appears to demand careful investigation. In India, these animals are horses and mules, and, in the case of heavy batteries and transport lines, bullocks and elephants. It has not been proved that these animals ever suffer from enteric fever, or that the disease can be experimentally produced in them. But, although uncommon, it has been established that certain animals may suffer from a disease, undistinguishable clinically and pathologically from the enteric fever of man, while the experimental transmission of the disease in the case of rabbits and white rats has been demonstrated (Horton-Smith, Goulstonian Lectures, 1900).

38. In connection with the greater prevalence of enteric fever in the mounted as compared with the dismounted branches of the service, I venture to suggest the following points for consideration: —The same purity of water-supply for watering animals is not insisted on, as is the case in the drinking supplies for human beings. 1. Is it possible that, while having no pathogenic influence on the animal, typhoid bacilli may sometimes be passed through its body in an active condition, and so infect stable litter, the ground of stables, horse and cattle lines, &c.? 2. The men are more in the way of temptation to drink unsterilized water to assuage the pressing calls of tropical thirst than is the case with the infantry soldier.

39. Enteric fever among officers, women, and children* :—

—	1878.					
	Average strength.	Admissions.	Deaths.	Ratio per 1,000.		Percentage of mortality to attack.
				Admissions.	Deaths.	
Officers ..	1,268	12	3	9·46	2·36	25·0
Women ..	2,868	6	5*	2·05	1·74	83·3
Children ..	6,075	14	3	2·31	4·95	21·4

* Includes one admission of 1877.

The points of interest brought out in the above tables are :—

1. That the increase of prevalence of enteric fever year after year up to 1898 among the men was also observed in the case of officers, women, and children ; and that the decreased prevalence manifested in 1899 and 1900 was also common to all.
2. That the women have always remained remarkably free from attack by enteric fever, but a very high mortality is observed when they are attacked.
3. The relatively small death rate from the disease among the children (noted in connection with the fact that enteric fever is much more fatal in character in India than in Europe).

Relation to Field Service.

40. Under both peace and war conditions, enteric fever is peculiarly a disease of armies, but field service is invariably accompanied and followed by increased enteric prevalence, while in its geographical distribution the disease is world-wide. The special liability of troops on service to attack by enteric fever is only a too well-known fact, borne out in our own case by experience gained in Afghanistan, in Africa, in our numerous Indian Frontier expeditions, and again in the present South African war. Similar experience has

* See table also on page 426.

	1898.						1899.						1900.					
	Average strength.	Admissions.	Deaths.	Ratio per 1,000.		Percentage of mortality to attack.	Average strength.	Admissions.	Deaths.	Ratio per 1,000.		Percentage of mortality to attack.	Average strength.	Admissions.	Deaths.	Ratio per 1,000.		Percentage of mortality to attack.
				Admissions.	Deaths.					Admissions.	Deaths.					Admissions.	Deaths.	
Officers ..	1,857	76	15	40·9	8·03	19·7	1,908	55	10	28·8	5·24	18·18	1,780	39	9	21·9	5·06	23·07
Women ..	3,118	38	15	12·2	4·81	39·4	3,093	18	7	5·8	2·26	39·0	2,908	22	7	7·6	2·41	31·8
Children ..	5,592	39	3	7·0	·54	7·7	5,560	27	2	4·9	·36	7·4	5,376	25	4	4·7	·74	16·0

attended the Americans in the United States, in Cuba more recently, and now again in the Philippines; the French have observed the same fact in connection with their army in Algeria; and the Germans have had the same experience in 1900-01 in connection with their young soldiers in China.

41. It is not to be wondered at, therefore, that field service has been a somewhat potent factor in increasing the prevalence of enteric fever in India. The cases dealt with in camp on service are separately returned in the special returns for the particular expedition, and do not appear in the annual general returns. The cases referred to as swelling the general returns are enteric cases transferred to stations from troops in the field, cases contributed to stations by troops passing through from field service, and cases which occur among such troops within the first week or two after their return to their permanent stations. The disease may in this way be imported and lead to a more or less widespread outbreak. Numerous instances could be given, but the following will illustrate what is meant. In 1897, 20 cases of enteric fever were transferred to Peshawar from Jamrud and Hari Singh-ka Burj. In 1898, the Rawal Pindi returns were greatly increased by enteric admissions from troops returned and passing through from field service, the most marked example being the Duke of Cornwall's Light Infantry, from which regiment, although only sixteen days in the station, there were 14 admissions for enteric fever with five deaths. Instances of importation to stations by regiments arriving from the front occurred in 1898 at Ahmednagar, Fyzabad, and Cawnpore. What was true of 1897 and 1898 is likely also to be true of the years before them. Since 1884, the year from which we have marked the beginning of decided enteric prevalence, scarcely a year has passed without one or more frontier expeditions, and it is a significant fact that some of the years which show marked increase were either preceded by a year in which large field operations were going on, or the year itself was one of a large frontier expedition. Thus, in 1897, there were the Tochi, Malakand, Mohmund, Utman Khel, Buner, Kohat-Kurram, and Tirah expeditions. Further, we know that enteric fever was prevalent among the troops in the field, and an extraordinary increase in 1897-98 occurred in the Punjab.

Age and Recent Arrival.

42. The predisposing influences of youth and recent arrival in the country of the young soldier are too well known and recognized to require lengthy comment. They have been pointed out in every Army Medical Department Report since 1872.

43. In India, as in all tropical countries, the young European is more liable to attack by enteric fever, and the disease is more fatal in its effects than is the case in a temperate climate.

44. Each trooping season brings a large influx of susceptible individuals, and to this circumstance more than any other is chiefly due the steady prevalence of enteric fever among the British troops in India. The period of greatest liability to attack is for men between 20 and 25 years of age. In support of the view that steady prevalence is largely due to an increased supply of susceptible individuals, the following facts are of great importance:—

1. In 1878, 35 per cent. of the British troops in India were men under 25 years of age, while in 1898 there were 50·3 per cent. under that age.
2. With the short service system the men are more frequently changed, which leads to a constant circulation of men of the susceptible age, and a consequent still further increase in the number of the men likely to contract the disease.

45. The following table (p. 428) shows the relationship between enteric fever and age, for the three years 1898-1900.

From this table it can easily be calculated that 71·4 per cent. of the total admissions and 73·39 per cent. of the total deaths from enteric fever in 1898 occurred among men between 20 and 25 years of age. In 1899, 74·0 per cent. of the admissions and 73·27 per cent. of the deaths, and in 1900, 61·2 per cent. of the admissions and 60·9 of the deaths, belonged to the same age group.

Age.	1898.					1899.					1900.				
	Average strength.	Admissions.	Deaths.	Ratio per 1,000 of strength.		Average strength.	Admissions.	Deaths.	Ratio per 1,000 of strength.		Average strength.	Admissions.	Deaths.	Ratio per 1,000 of strength.	
				Admissions.	Deaths.				Admissions.	Deaths.				Admissions.	Deaths.
Under 20 years	2,147	53	14	24·7	6·52	1,973	37	6	18·8	3·04	1,370	26	4	19·0	2·92
From 20 to 25 years ..	31,796	1,696	480	53·3	15·10	32,947	1,031	255	31·3	7·74	25,689	594	176	23·1	6·85
„ 25 to 30 „ ..	22,035	489	143	22·2	6·49	24,658	284	75	11·5	3·04	25,235	304	93	12·0	3·69
„ 30 to 35 „ ..	4,688	42	12	9·0	2·56	4,664	27	10	5·8	2·14	5,480	33	11	6·0	2·01
„ 35 to 40 „ ..	1,414	6	5	4·2	3·54	1,500	3	2	2·0	1·33	1,500	7	5	4·7	3·33
„ 40 and upwards ..	409	—	—	—	—	464	—	—	—	—	511	1	—	2·0	—
Not stated	2,908	89	—	30·6	—	1,482	10	—	6·7	—	768	5	—	6·5	—
Total ..	65,397	2,375	654	36·3	10·00	67,697	1,392	348	20·6	5·14	60,553	970	289	16·0	4·77

Length of service in India.	1898.					1899.					1900.				
	Average strength.	Admissions.	Deaths.	Ratio per 1,000 of strength.		Average strength.	Admissions.	Deaths.	Ratio per 1,000 of strength.		Average strength.	Admissions.	Deaths.	Ratio per 1,000 of strength.	
				Admissions.	Deaths.				Admissions.	Deaths.				Admissions.	Deaths.
Under 1 year	11,551	1,057	281	91·5	24·33	12,208	621	138	51·6	11·47	2,892	88	23	30·4	7·95
1 to 2 years	11,215	426	110	38·0	9·81	12,191	369	94	30·3	7·71	9,679	274	89	28·3	9·20
2 to 3 „	11,066	394	100	26·6	9·04	10,735	124	33	11·6	3·07	10,360	212	63	20·5	6·08
3 to 4 „	9,558	221	70	23·1	7·32	9,481	101	29	10·7	3·06	9,486	112	31	11·8	3·27
4 to 5 „	7,760	160	52	20·6	6·70	8,157	67	20	8·2	2·45	8,830	107	28	12·1	3·17
5 to 10 „	9,408	126	40	13·4	4·25	11,397	100	34	8·8	2·98	15,851	165	51	10·4	3·22
10 years and over ..	1,931	2	1	1·0	·52	2,226	—	—	—	—	2,686	7	4	2·6	1·49
Not stated	2,908	89	—	30·6	—	1,482	10	—	6·7	—	769	5	—	6·5	—
Total ..	65,397	2,375	654	36·3	10·00	67,697	1,392	348	20·6	5·14	60,553	970	289	16·0	4·77

46. The next table (p. 429) shows the relationship between enteric fever and service in India.

The liability of the young soldier to contract enteric fever in the first year of his Indian service is very strikingly shown in the table for 1898. It will be observed that in that year 9·15 out of every 100 of the men under a year in the country were attacked, and that 2·43 out of every 100 of them died. Furthermore, 44·5 per cent. of the total admissions for enteric fever, and 43 per cent. of the total deaths from it, during 1898, occurred among men who had been less than a year in India. In the same year, men in the second year of service in the country yielded 17·9 per cent. of the total cases and 16·8 per cent. of the total deaths, while it will be seen that as the years of service in the country increase, the admissions and mortality rates show steady diminution, susceptibility lessening as the soldier becomes acclimatized.

47. There can be no doubt that a considerable part of the decrease observed in 1900 was due to the absence of individuals specially susceptible to the disease, as owing to the suspension of trooping only a few small drafts of men came into the country during the year. Thus, the number of cases of enteric fever which occurred among men of under one year's service in India was only 88 as compared with 621 in 1899 and 1,057 in 1898. Still the admission ratio for the under one year period, 30·4 per 1,000, shows such a large decrease, when compared with the admission ratios for the corresponding period in 1899 and 1898, namely 51·6 and 91·5 respectively, as to render it almost certain that part of the diminution observed in 1900 was a real decrease of enteric prevalence due to more satisfactory causes than the mere absence of susceptible men. The latter assumption readily enough accounts for a decrease in the actual number of cases, but the very large diminution in the admission ratio is more difficult to explain. Had the chances of contracting enteric fever remained the same as in the previous year, then, out of the 2,892 men belonging to the under one year period in 1900, the number of cases should have been 149 instead of 88, while calculated according to the ratio of enteric prevalence in 1898, the number of cases which occurred in that year among an equal number of men belonging to the same period works out to 264, or exactly three times the number of 1900. The admission ratio for men in their second year of Indian service is also lower than in 1899, 28·3 against 30·3, and considerably lower than in 1898, 28·3 against 38·0. There has therefore been a decrease of prevalence of enteric fever among the men most susceptible to it. The decrease is the more satisfactory inasmuch as two large outbreaks have to be recorded for the year, one at Quetta and the other at Secunderabad. Moreover, the diminution in enteric prevalence observed in 1899 was associated with a greatly lessened prevalence of malarial fevers, whereas in 1900 the further decrease of enteric prevalence occurred notwithstanding an abnormal increase of malarial fever with its accompanying debility.

48. The greater susceptibility of young soldiers and recent arrivals may be due to—

1. Physiological susceptibility—the susceptibility of men of the enteric age to contract the disease, observed all the world over, apart from considerations of climate.
2. Special susceptibility. The systemic disturbance (acclimatization changes), going on in the body at first, while the different organs are adapting themselves to the new conditions of life brought about by transference from a temperate to a hot climate, often manifested by digestive disturbances, diarrhœa, &c., must frequently produce conditions favouring attack by the typhoid bacillus should it gain entrance.
3. Want of experience, and, therefore, want of care in regard to diet, exercise, and general care of the health, with the result that the men get out of condition, and consequently become more liable to develop disease; while they are also more likely to be careless as to the sources of drinks and food which they may partake of outside barracks.

49. Other predisposing causes are malarial attacks, exposure to the sun, over-exertion in the hot weather, and, in short, debility of any kind from whatever cause arising.

Seasonal Prevalence.

50. In Bengal and the Punjab, enteric fever is chiefly prevalent during the first half of the year, whereas in the Bombay and Madras Commands most cases are admitted in the second half. The latter point is particularly well shown in the case of Quetta (Bombay Command) where the season for enteric prevalence is from July to November, while the station is usually entirely free from the disease in the early months of the year; both facts are well demonstrated in the epidemics of 1896, 1898, and 1900. It is stated that the first months of the enteric season at Quetta are marked by dust storms and some water scarcity, whereas in many of the other Bombay and Madras stations, enteric prevalence is associated with the monsoon period.

51. It is regularly observed that the period of maximum prevalence occurs in April for Bengal, in May for the Punjab, and in August or September for Bombay and Madras.

52. Charts have appeared in the Army Medical Department Reports since 1898, which show the monthly prevalence of enteric fever among the British troops in India and its distribution in the four commands. The charts for Bengal and the Punjab regularly show three well-marked periods of special prevalence. First, with the commencement of the hot weather, the disease begins to increase, and reaches its highest point for the year in April for Bengal, and in May for the Punjab, and it is interesting to note that the increase begins to show itself in February in Bengal, and a month later in the Punjab. A sudden decrease of prevalence in both commands is observed in June and July; but in 1900 this fall was less abrupt than usual. The second period of prevalence is a small but usually a well marked increase, beginning in August in Bengal, reaching its highest point in September, and falling again in October; in the Punjab, the second increase is a small one in August with a fall in September and October, but in 1900 this increase was scarcely marked at all. The third period begins in November and continues through December into January in both commands. In Bombay and Madras there is a slight rise in April, but the special season of bacterial activity is probably July (corresponding to the monsoon period), with increased disease prevalence in August and September.

Etiological Considerations.

53. In reviewing the progress of hygiene during the year in the Army Medical Department Report for 1860, Professor Parkes, in the course of some remarks on the views held by Dr. William Budd which were being published at the time in the *British Medical Journal*, ends by stating:—"We can only here remark that whatever view be taken (whether the specific poison increases only in the body or in the sewage air), the grand fact is clear that the occurrence of typhoid fever points unequivocally to defective removal of excreta, and that it is a disease altogether and easily preventable. Typhoid fever ought soon to disappear from every return of disease." Unfortunately the expectation expressed in the last sentence has not been realized. Just forty years later, at the annual meeting of the British Medical Association held in 1901, we find that Dr. A. C. Houston, in opening a discussion on "Enteric fever in its Public Health Aspects," begins with these remarks:—"That notwithstanding the progress of science and the great efficiency of the public health service, we find ourselves at the beginning of a new century unable to stamp out a disease which is nevertheless still classed as a preventable one. All we can say is that at the present time the mortality from it is less than it was some years ago."

54. As in England, so in India, only very limited success has attended the efforts to stamp the disease out, and as the preceding pages show, enteric fever continues to figure very largely indeed in our returns. The improvement observed in the enteric statistics for 1899 and 1900 is probably in part the result of better sanitation, but to what extent the decrease will be permanent, time alone will show, when trooping is re-established and the usual influx of specially susceptible individuals is taking place.

55. The causation of enteric fever is the question of the day for the army

sanitarian. Notwithstanding the earnest and sustained efforts for years past of investigators in every part of the world, it must be acknowledged that we are still groping very much in the dark in our attempts to discover the specific source of the disease in any given outbreak, be it large or small. When we know with exactitude the favouring conditions of life under which the *Bacillus typhosus* passes its saprophytic existence outside the body, and when we are in possession of accurate knowledge with regard to the exact relationship existing between the specific bacillus and the other very numerous members of the *coli* family of micro-organisms, then only will we be in a position to direct our inquiries with an approach to scientific precision.

56. To trace the causation of outbreaks of enteric fever in India is nearly always difficult and often impossible. The disease is endemic in most military stations, and in many it is prevalent throughout the year. Cases may occur in all parts of barracks, and yet it may be impossible to trace any direct connection or link between them. Even when the disease assumes an epidemic form, it is, more often than not, impossible to trace the source of the specific poison with any degree of certainty.

57. The difficulty of tracing the source of the disease is increased by the fact that the present known bacteriological methods often fail us. The typhoid bacillus is closely resembled by the *Bacillus coli communis*, and there are numerous forms intermediate between the two, some of which, in characters and behaviour to tests, bear a very near resemblance to the specific bacillus. According to some authorities, certain of these coliform organisms may, under favouring conditions, assume a virulent and pathogenic character and give rise to a disease clinically undistinguishable from enteric fever, but the evidence on which this view is based is not very conclusive. Then, again, there is the well known difficulty of isolating the typhoid bacillus from specifically polluted water or sewage, and recent observations have shown that it is not an easy matter to detect it even in enteric faeces. These difficulties are chiefly brought about by the presence of other organisms which are antagonistic, or which liquefy gelatine, or which develop more rapidly and so obscure or prevent the growth of the typhoid bacilli colonies. Horton-Smith, after discussing the relationship existing between the typhoid bacillus and other members of the *coli* group, ends by stating:—"The species, though having a common ancestor, are now absolutely distinct. But though this is so, and though with care the typhoid bacillus can be accurately distinguished from the other members of the group, it is by no means a simple matter." Such being the facts, the frequent failure of bacteriological investigation is not a surprising matter.

58. Since it is often difficult to establish the fact of specific pollution, it follows that evidence of sewage pollution is the best working hypothesis on which to base our preventive measures.

59. In a report written in 1899 and circulated to all army medical officers in India, attention was called to the subject of typhoid bacilluria, and it was pointed out that the specific bacilli could be found in the urine, though probably in not more than 25 per cent. of all cases, and that when they did occur, they existed in enormous numbers. The knowledge that typhoid bacilli may be present in the urine of enteric patients is not a new fact, but in 1895, Professor Wright and Major Semple, R.A.M.C., attracted renewed attention to it in connection with the danger of such urine being a fertile means of spreading the disease.* In 1897 Dr. Horton-Smith† also called attention to the occurrence of typhoid bacilli in the urine. Since then he has continued his investigations and, in the Goulstonian Lectures for 1900, he states "that typhoid bacilluria, such as we see it in the wards, is due to the infection of the urine by a stray typhoid bacillus, excreted by the kidneys from the blood, and its immediate multiplication in the bladder urine. If, in addition, the bladder walls have been in any way damaged, then true typhoidal cystitis follows." He confirms the fact that bacilluria occurs in about one out of every four cases, and points out that the condition is rare

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* *Lancet*, 27th July, 1895.
† *Medico-Chirurgical Transactions*, 1897.

by the different arms of the service from 1895 to 1900 with the ratios per 1,000 of strength.

1898.					1899.					1900.					Total.				
Strength.	Cases of Enteric Fever.		Ratio per 1,000.		Strength.	Cases of Enteric Fever.		Ratio per 1,000.		Strength.	Cases of Enteric Fever.		Ratio per 1,000.		Strength.	Cases of Enteric Fever.		Ratio per 1,000.	
	Admitted.	Died.	Admissions.	Deaths.		Admitted.	Died.	Admissions.	Deaths.		Admitted.	Died.	Admissions.	Deaths.		Admitted.	Died.	Admissions.	Deaths.
4,855	263	58	54·2	11·95	4,587	209	55	45·6	11·99	2,603	94	24	36·1	9·22	28,008	1,137	290	40·6	10·35
8,282	277	80	33·4	9·66	8,366	248	68	29·8	8·16	7,061	101	31	14·3	4·39	49,694	1,380	375	27·8	7·55
..	..	..	..	..	14	..	..	..	..	82	2	1	24·4	12·20	96	2	1	20·8	10·42
91	5	1	54·9	10·99	74	3	1	40·5	13·51	..	..	..	..	..	430	15	4	34·9	9·30
71	2	1	28·2	14·08	75	1	1	13·3	13·33	85	2	1	23·5	11·76	493	7	3	14·2	6·09
80	1	..	12·5	..	91	4	..	44·0	..	81	3	1	37·0	12·35	532	18	4	33·8	7·52
79	1	..	12·7	..	87	..	..	..	..	86	2	..	23·3	..	520	17	1	32·7	1·92
321	9	2	28·0	6·23	341	8	2	23·5	5·87	334	9	3	26·9	8·98	2,071	59	13	28·5	6·28
2,889	74	27	25·6	9·35	3,007	20	7	6·7	2·33	2,894	22	5	7·6	1·73	17,696	273	71	15·4	4·01
11,492	360	109	31·3	9·48	11,684	276	77	23·6	6·59	10,289	132	39	12·8	3·79	69,461	1,712	459	24·6	6·61
44,912	1,690	455	37·7	10·85	47,444	804	215	19·1	4·53	43,560	740	222	17·0	5·10	276,057	7,185	1,913	26·0	6·93

differences in the surroundings of the two barracks are, that the cavalry barracks are nearer the bazar, and that there is a native village at no great distance.

Munson also points out* the much greater prevalence of enteric fever amongst the cavalry of the United States troops. He states that "for the period 1867–83, inclusive, the admission rates per 1,000 of strength were as follows: cavalry, 19; infantry, 4·6; artillery, 2·5. For this sixteen-year period, the cavalry thus suffered more than seven times as much from typhoid as did the artillery and nearly five times as much as the infantry, while its death rate was more than three times greater than either of the others. This great difference was largely due to the active field service against Indians required of mounted troops. For the seven-year period 1890–96 the admission rates per 1,000 of strength were 8·03 for the cavalry, 5·74 for the infantry and 4·74 for the artillery. In time of peace, the Medical Department is affected less than any of the above arms of the service; during the war with Spain it suffered more than twice as much as any of them."

34. The foregoing table shows that the admission ratio among the cavalry for the six years was 40·6 per 1,000, as compared with 26·0 for the infantry, and 24·6 for the artillery. Further it will be observed that the disease was most prevalent among cavalry soldiers for each of the years except 1896, in which year the infantry admission ratio was a little higher than that for the cavalry, 27·2 against 26·8.

35. The figures for the artillery, as a whole, occupy a position intermediate between those for the cavalry and the infantry, but are much nearer infantry than cavalry figures. The artillery statistics have been split up in order to show the difference in the enteric prevalence in the mounted and dismounted branches, and the figures are arranged in three groups:—

1. Horse, field and mountain batteries are grouped together, as they closely approximate cavalry in their conditions of life.
2. The four garrison companies employed as heavy batteries are grouped separately, as the men have also to deal with animals (bullocks and elephants) in their daily work.
3. Garrison artillery companies (excluding mountain and heavy batteries) —men living under infantry conditions.

36. The analysis of the ratios thus obtained is of great interest. Dealing with the total statistics for the six years, we find that the heavy batteries had the highest admission ratio, 28·5 per 1,000, which is followed by 27·8 for the horse, field and mountain battery group; and it should be observed that these ratios are much lower than that for the cavalry. The ratio for the garrison artillery works out 15·4 per 1,000, which, in its turn, is lower than 26·0, the infantry ratio. There are two points of interest here,—first, enteric fever was only about half as prevalent in the garrison as compared with the other branches of the artillery; second, the disease was less prevalent among horse, field, mountain and heavy batteries than among cavalry, and among ordinary garrison artillery than among infantry. With regard to the second point, the explanation may be, that the artillery get men of better physique, and that they probably have a larger proportion of older men in the ranks than is the case in cavalry and infantry regiments.

37. The difference of prevalence of enteric fever in the different arms of the service during the six years 1895 to 1900 may be shown thus:—

	Ratio per 1,000 of Strength.	
	Admissions.	Deaths.
Cavalry	40·6	10·35
Artillery .. { Heavy batteries	28·5	6·28
Artillery .. { Horse, field and mountain ..	27·8	7·55
Infantry	26·0	6·93
Artillery, Garrison	15·4	4·01

* *Military Hygiene*, p. 690.

I can offer no satisfactory explanation of these figures, but direct attention to the statistical fact of the greater prevalence of enteric fever in the branches of the service in which the men are brought into daily contact with animals, as one which, to my mind, appears to demand careful investigation. In India, these animals are horses and mules, and, in the case of heavy batteries and transport lines, bullocks and elephants. It has not been proved that these animals ever suffer from enteric fever, or that the disease can be experimentally produced in them. But, although uncommon, it has been established that certain animals may suffer from a disease, undistinguishable clinically and pathologically from the enteric fever of man, while the experimental transmission of the disease in the case of rabbits and white rats has been demonstrated (Horton-Smith, Goulstonian Lectures, 1900).

38. In connection with the greater prevalence of enteric fever in the mounted as compared with the dismounted branches of the service, I venture to suggest the following points for consideration:—The same purity of water-supply for watering animals is not insisted on, as is the case in the drinking supplies for human beings. 1. Is it possible that, while having no pathogenic influence on the animal, typhoid bacilli may sometimes be passed through its body in an active condition, and so infect stable litter, the ground of stables, horse and cattle lines, &c.? 2. The men are more in the way of temptation to drink unsterilized water to assuage the pressing calls of tropical thirst than is the case with the infantry soldier.

39. Enteric fever among officers, women, and children*:—

—	1878.					
	Average strength.	Admissions.	Deaths.	Ratio per 1,000.		Percentage of mortality to attack.
				Admissions.	Deaths.	
Officers ..	1,268	12	3	9·46	2·36	25·0
Women ..	2,868	6	5*	2·09	1·74	83·3
Children ..	6,075	14	3	2·31	4·95	21·4

* Includes one admission of 1877.

The points of interest brought out in the above tables are:—

1. That the increase of prevalence of enteric fever year after year up to 1898 among the men was also observed in the case of officers, women, and children; and that the decreased prevalence manifested in 1899 and 1900 was also common to all.
2. That the women have always remained remarkably free from attack by enteric fever, but a very high mortality is observed when they are attacked.
3. The relatively small death rate from the disease among the children (noted in connection with the fact that enteric fever is much more fatal in character in India than in Europe).

Relation to Field Service.

40. Under both peace and war conditions, enteric fever is peculiarly a disease of armies, but field service is invariably accompanied and followed by increased enteric prevalence, while in its geographical distribution the disease is world-wide. The special liability of troops on service to attack by enteric fever is only a too well-known fact, borne out in our own case by experience gained in Afghanistan, in Africa, in our numerous Indian Frontier expeditions, and again in the present South African war. Similar experience has

* See table also on page 426.

	1898.						1899.						1900.					
	Average strength.	Admissions.	Deaths.	Ratio per 1,000. Admissions.	Ratio per 1,000. Deaths.	Percentage of mortality to attack.	Average strength.	Admissions.	Deaths.	Ratio per 1,000. Admissions.	Ratio per 1,000. Deaths.	Percentage of mortality to attack.	Average strength.	Admissions.	Deaths.	Ratio per 1,000. Admissions.	Ratio per 1,000. Deaths.	Percentage of mortality to attack.
Officers	1,857	76	15	40·9	8·03	19·7	1,908	55	10	28·8	5·24	18·18	1,780	39	9	21·9	5·06	23·07
Women ..	3,118	38	15	12·2	4·81	39·4	3,093	18	7	5·8	2·26	39·0	2,908	22	7	7·6	2·41	31·8
Children ..	5,592	39	3	7·0	·54	7·7	5,500	27	2	4·9	·36	7·4	5,376	25	4	4·7	·74	16·0

attended the Americans in the United States, in Cuba more recently, and now again in the Philippines; the French have observed the same fact in connection with their army in Algeria; and the Germans have had the same experience in 1900–01 in connection with their young soldiers in China.

41. It is not to be wondered at, therefore, that field service has been a somewhat potent factor in increasing the prevalence of enteric fever in India. The cases dealt with in camp on service are separately returned in the special returns for the particular expedition, and do not appear in the annual general returns. The cases referred to as swelling the general returns are enteric cases transferred to stations from troops in the field, cases contributed to stations by troops passing through from field service, and cases which occur among such troops within the first week or two after their return to their permanent stations. The disease may in this way be imported and lead to a more or less widespread outbreak. Numerous instances could be given, but the following will illustrate what is meant. In 1897, 20 cases of enteric fever were transferred to Peshawar from Jamrud and Hari Singh-ka Burj. In 1898, the Rawal Pindi returns were greatly increased by enteric admissions from troops returned and passing through from field service, the most marked example being the Duke of Cornwall's Light Infantry, from which regiment, although only sixteen days in the station, there were 14 admissions for enteric fever with five deaths. Instances of importation to stations by regiments arriving from the front occurred in 1898 at Ahmednagar, Fyzabad, and Cawnpore. What was true of 1897 and 1898 is likely also to be true of the years before them. Since 1884, the year from which we have marked the beginning of decided enteric prevalence, scarcely a year has passed without one or more frontier expeditions, and it is a significant fact that some of the years which show marked increase were either preceded by a year in which large field operations were going on, or the year itself was one of a large frontier expedition. Thus, in 1897, there were the Tochi, Malakand, Mohmund, Utman Khel, Buner, Kohat-Kurram, and Tirah expeditions. Further, we know that enteric fever was prevalent among the troops in the field, and an extraordinary increase in 1897–98 occurred in the Punjab.

Age and Recent Arrival.

42. The predisposing influences of youth and recent arrival in the country of the young soldier are too well known and recognized to require lengthy comment. They have been pointed out in every Army Medical Department Report since 1872.

43. In India, as in all tropical countries, the young European is more liable to attack by enteric fever, and the disease is more fatal in its effects than is the case in a temperate climate.

44. Each trooping season brings a large influx of susceptible individuals, and to this circumstance more than any other is chiefly due the steady prevalence of enteric fever among the British troops in India. The period of greatest liability to attack is for men between 20 and 25 years of age. In support of the view that steady prevalence is largely due to an increased supply of susceptible individuals, the following facts are of great importance:—

1. In 1878, 35 per cent. of the British troops in India were men under 25 years of age, while in 1898 there were 50·3 per cent. under that age.
2. With the short service system the men are more frequently changed, which leads to a constant circulation of men of the susceptible age, and a consequent still further increase in the number of the men likely to contract the disease.

45. The following table (p. 428) shows the relationship between enteric fever and age, for the three years 1898–1900.

From this table it can easily be calculated that 71·4 per cent. of the total admissions and 73·39 per cent. of the total deaths from enteric fever in 1898 occurred among men between 20 and 25 years of age. In 1899, 74·0 per cent. of the admissions and 73·27 per cent. of the deaths, and in 1900, 61·2 per cent. of the admissions and 60·9 of the deaths, belonged to the same age group.

Age.	1898.					1899.					1900.				
	Average strength.	Admissions.	Deaths.	Ratio per 1,000 of strength.		Average strength.	Admissions.	Deaths.	Ratio per 1,000 of strength.		Average strength.	Admissions.	Deaths.	Ratio per 1,000 of strength.	
				Admissions.	Deaths.				Admissions.	Deaths.				Admissions.	Deaths.
Under 20 years	2,147	53	14	24·7	6·52	1,973	37	6	18·8	3·04	1,370	26	4	19·0	2·92
From 20 to 25 years ..	31,796	1,696	480	53·3	15·10	32,947	1,031	255	31·3	7·74	25,689	594	176	23·1	6·85
„ 25 to 30 „ ..	22,035	489	143	22·2	6·49	24,658	284	75	11·5	3·04	25,235	304	93	12·0	3·69
„ 30 to 35 „ ..	4,688	42	12	9·0	2·56	4,664	27	10	5·8	2·14	5,480	33	11	6·0	2·01
„ 35 to 40 „ ..	1,414	6	5	4·2	3·54	1,509	3	2	2·0	1·33	1,500	7	5	4·7	3·33
„ 40 and upwards ..	409	—	—	—	—	464	—	—	—	—	511	1	—	2·0	—
Not stated	2,908	89	—	30·6	—	1,482	10	—	6·7	—	768	5	—	6·5	—
Total ..	65,397	2,375	654	36·3	10·00	67,697	1,392	348	20·6	5·14	60,553	970	239	16·0	4·77

Length of service in India.	1898.					1899.					1900.				
	Average strength.	Admissions.	Deaths.	Ratio per 1,000 of strength.		Average strength.	Admissions.	Deaths.	Ratio per 1,000 of strength.		Average strength.	Admissions.	Deaths.	Ratio per 1,000 of strength.	
				Admissions.	Deaths.				Admissions.	Deaths.				Admissions.	Deaths.
Under 1 year	11,551	1,057	281	91·5	24·33	12,208	621	138	51·6	11·47	2,892	88	23	30·4	7·95
1 to 2 years	11,215	426	110	38·0	9·81	12,191	369	94	30·3	7·71	9,679	274	89	28·3	9·20
2 to 3 „	11,066	394	100	26·6	9·04	10,735	124	33	11·6	3·07	10,360	212	63	20·5	6·08
3 to 4 „	9,558	221	70	23·1	7·32	9,481	101	29	10·7	3·06	9,486	112	31	11·8	3·27
4 to 5 „	7,760	160	52	20·6	6·70	8,157	67	20	8·2	2·45	8,830	107	28	12·1	3·17
5 to 10 „	9,408	126	40	13·4	4·25	11,397	100	34	8·8	2·98	15,851	165	51	10·4	3·22
10 years and over ..	1,931	2	1	1·0	·52	2,226	—	—	—	—	2,686	7	4	2·6	1·49
Not stated	2,908	89	—	30·6	—	1,482	10	—	6·7	—	769	5	—	6 5	—
Total ..	65,397	2,375	654	36·3	10·00	67,697	1,392	348	20·6	5·14	60,553	970	289	16·0	4·77

46. The next table (p. 429) shows the relationship between enteric fever and service in India.

The liability of the young soldier to contract enteric fever in the first year of his Indian service is very strikingly shown in the table for 1898. It will be observed that in that year 9·15 out of every 100 of the men under a year in the country were attacked, and that 2·43 out of every 100 of them died. Furthermore, 44·5 per cent. of the total admissions for enteric fever, and 43 per cent. of the total deaths from it, during 1898, occurred among men who had been less than a year in India. In the same year, men in the second year of service in the country yielded 17·9 per cent. of the total cases and 16·8 per cent. of the total deaths, while it will be seen that as the years of service in the country increase, the admissions and mortality rates show steady diminution, susceptibility lessening as the soldier becomes acclimatized.

47. There can be no doubt that a considerable part of the decrease observed in 1900 was due to the absence of individuals specially susceptible to the disease, as owing to the suspension of trooping only a few small drafts of men came into the country during the year. Thus, the number of cases of enteric fever which occurred among men of under one year's service in India was only 88 as compared with 621 in 1899 and 1,057 in 1898. Still the admission ratio for the under one year period, 30·4 per 1,000, shows such a large decrease, when compared with the admission ratios for the corresponding period in 1899 and 1898, namely 51·6 and 91·5 respectively, as to render it almost certain that part of the diminution observed in 1900 was a real decrease of enteric prevalence due to more satisfactory causes than the mere absence of susceptible men. The latter assumption readily enough accounts for a decrease in the actual number of cases, but the very large diminution in the admission ratio is more difficult to explain. Had the chances of contracting enteric fever remained the same as in the previous year, then, out of the 2,892 men belonging to the under one year period in 1900, the number of cases should have been 149 instead of 88, while calculated according to the ratio of enteric prevalence in 1898, the number of cases which occurred in that year among an equal number of men belonging to the same period works out to 264, or exactly three times the number of 1900. The admission ratio for men in their second year of Indian service is also lower than in 1899, 28·3 against 30·3, and considerably lower than in 1898, 28·3 against 38·0. There has therefore been a decrease of prevalence of enteric fever among the men most susceptible to it. The decrease is the more satisfactory inasmuch as two large outbreaks have to be recorded for the year, one at Quetta and the other at Secunderabad. Moreover, the diminution in enteric prevalence observed in 1899 was associated with a greatly lessened prevalence of malarial fevers, whereas in 1900 the further decrease of enteric prevalence occurred notwithstanding an abnormal increase of malarial fever with its accompanying debility.

48. The greater susceptibility of young soldiers and recent arrivals may be due to—

1. Physiological susceptibility—the susceptibility of men of the enteric age to contract the disease, observed all the world over, apart from considerations of climate.
2. Special susceptibility. The systemic disturbance (acclimatization changes), going on in the body at first, while the different organs are adapting themselves to the new conditions of life brought about by transference from a temperate to a hot climate, often manifested by digestive disturbances, diarrhœa, &c., must frequently produce conditions favouring attack by the typhoid bacillus should it gain entrance.
3. Want of experience, and, therefore, want of care in regard to diet, exercise, and general care of the health, with the result that the men get out of condition, and consequently become more liable to develop disease; while they are also more likely to be careless as to the sources of drinks and food which they may partake of outside barracks.

49. Other predisposing causes are malarial attacks, exposure to the sun, over-exertion in the hot weather, and, in short, debility of any kind from whatever cause arising.

Seasonal Prevalence.

50. In Bengal and the Punjab, enteric fever is chiefly prevalent during the first half of the year, whereas in the Bombay and Madras Commands most cases are admitted in the second half. The latter point is particularly well shown in the case of Quetta (Bombay Command) where the season for enteric prevalence is from July to November, while the station is usually entirely free from the disease in the early months of the year; both facts are well demonstrated in the epidemics of 1896, 1898, and 1900. It is stated that the first months of the enteric season at Quetta are marked by dust storms and some water scarcity, whereas in many of the other Bombay and Madras stations, enteric prevalence is associated with the monsoon period.

51. It is regularly observed that the period of maximum prevalence occurs in April for Bengal, in May for the Punjab, and in August or September for Bombay and Madras.

52. Charts have appeared in the Army Medical Department Reports since 1898, which show the monthly prevalence of enteric fever among the British troops in India and its distribution in the four commands. The charts for Bengal and the Punjab regularly show three well-marked periods of special prevalence. First, with the commencement of the hot weather, the disease begins to increase, and reaches its highest point for the year in April for Bengal, and in May for the Punjab, and it is interesting to note that the increase begins to show itself in February in Bengal, and a month later in the Punjab. A sudden decrease of prevalence in both commands is observed in June and July; but in 1900 this fall was less abrupt than usual. The second period of prevalence is a small but usually a well marked increase, beginning in August in Bengal, reaching its highest point in September, and falling again in October; in the Punjab, the second increase is a small one in August with a fall in September and October, but in 1900 this increase was scarcely marked at all. The third period begins in November and continues through December into January in both commands. In Bombay and Madras there is a slight rise in April, but the special season of bacterial activity is probably July (corresponding to the monsoon period), with increased disease prevalence in August and September.

Etiological Considerations.

53. In reviewing the progress of hygiene during the year in the Army Medical Department Report for 1860, Professor Parkes, in the course of some remarks on the views held by Dr. William Budd which were being published at the time in the *British Medical Journal*, ends by stating:—"We can only here remark that whatever view be taken (whether the specific poison increases only in the body or in the sewage air), the grand fact is clear that the occurrence of typhoid fever points unequivocally to defective removal of excreta, and that it is a disease altogether and easily preventable. Typhoid fever ought soon to disappear from every return of disease." Unfortunately the expectation expressed in the last sentence has not been realized. Just forty years later, at the annual meeting of the British Medical Association held in 1901, we find that Dr. A. C. Houston, in opening a discussion on "Enteric fever in its Public Health Aspects," begins with these remarks:—"That notwithstanding the progress of science and the great efficiency of the public health service, we find ourselves at the beginning of a new century unable to stamp out a disease which is nevertheless still classed as a preventable one. All we can say is that at the present time the mortality from it is less than it was some years ago."

54. As in England, so in India, only very limited success has attended the efforts to stamp the disease out, and as the preceding pages show, enteric fever continues to figure very largely indeed in our returns. The improvement observed in the enteric statistics for 1899 and 1900 is probably in part the result of better sanitation, but to what extent the decrease will be permanent, time alone will show, when trooping is re-established and the usual influx of specially susceptible individuals is taking place.

55. The causation of enteric fever is the question of the day for the army

sanitarian. Notwithstanding the earnest and sustained efforts for years past of investigators in every part of the world, it must be acknowledged that we are still groping very much in the dark in our attempts to discover the specific source of the disease in any given outbreak, be it large or small. When we know with exactitude the favouring conditions of life under which the *Bacillus typhosus* passes its saprophytic existence outside the body, and when we are in possession of accurate knowledge with regard to the exact relationship existing between the specific bacillus and the other very numerous members of the *coli* family of micro-organisms, then only will we be in a position to direct our inquiries with an approach to scientific precision.

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57. The difficulty of tracing the source of the disease is increased by the fact that the present known bacteriological methods often fail us. The typhoid bacillus is closely resembled by the *Bacillus coli communis*, and there are numerous forms intermediate between the two, some of which, in characters and behaviour to tests, bear a very near resemblance to the specific bacillus. According to some authorities, certain of these coliform organisms may, under favouring conditions, assume a virulent and pathogenic character and give rise to a disease clinically undistinguishable from enteric fever, but the evidence on which this view is based is not very conclusive. Then, again, there is the well known difficulty of isolating the typhoid bacillus from specifically polluted water or sewage, and recent observations have shown that it is not an easy matter to detect it even in enteric fæces. These difficulties are chiefly brought about by the presence of other organisms which are antagonistic, or which liquefy gelatine, or which develop more rapidly and so obscure or prevent the growth of the typhoid bacilli colonies. Horton-Smith, after discussing the relationship existing between the typhoid bacillus and other members of the *coli* group, ends by stating:—"The species, though having a common ancestor, are now absolutely distinct. But though this is so, and though with care the typhoid bacillus can be accurately distinguished from the other members of the group, it is by no means a simple matter." Such being the facts, the frequent failure of bacteriological investigation is not a surprising matter.

58. Since it is often difficult to establish the fact of specific pollution, it follows that evidence of sewage pollution is the best working hypothesis on which to base our preventive measures.

59. In a report written in 1899 and circulated to all army medical officers in India, attention was called to the subject of typhoid bacilluria, and it was pointed out that the specific bacilli could be found in the urine, though probably in not more than 25 per cent. of all cases, and that when they did occur, they existed in enormous numbers. The knowledge that typhoid bacilli may be present in the urine of enteric patients is not a new fact, but in 1895, Professor Wright and Major Semple, R.A.M.C., attracted renewed attention to it in connection with the danger of such urine being a fertile means of spreading the disease.* In 1897 Dr. Horton-Smith† also called attention to the occurrence of typhoid bacilli in the urine. Since then he has continued his investigations and, in the Goulstonian Lectures for 1900, he states "that typhoid bacilluria, such as we see it in the wards, is due to the infection of the urine by a stray typhoid bacillus, excreted by the kidneys from the blood, and its immediate multiplication in the bladder urine. If, in addition, the bladder walls have been in any way damaged, then true typhoidal cystitis follows." He confirms the fact that bacilluria occurs in about one out of every four cases, and points out that the condition is rare

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* *Lancet*, 27th July, 1895.
† *Medico-Chirurgical Transactions*, 1897.

before the third week of the disease; after this it may occur at any time during the fever, but not uncommonly its occurrence is delayed until the early days of convalescence. When it does appear, bacilluria is very persistent; the shortest duration recorded is eight days, but in four other cases it had not disappeared until after the lapse of 21 days, 28 days, 30 days, and 70 days, and Horton-Smith adds that "occasionally it may persist, not for months, but for years, as in a remarkable case recorded by Gwyn." The bacilli are nearly always present in the urine in pure culture, and in such extraordinary numbers that one cubic centimetre may contain as many as 500,000,000 micro-organisms. Horton-Smith, while pointing out that the specific micro-organism can be demonstrated in the stools during the first and second and early part of the third week of the disease, and possibly during the early part of a relapse, considers that the chief means by which the disease is spread is through the urine of patients showing typhoid bacilluria.

60. The importance of these observations in connection with the spread of enteric fever in India is manifest. Urine containing specific bacilli must often be spilt over the ground surface of barrack urinals, and the possibility of the subsequent transmission of the micro-organisms, in dust or through the agency of flies, to articles of food or drink, is obvious. The same dangerous condition may also occur in the latrines. There must often be infected urine in the excreta spread out in the filth trenches (Allahabad system), and it is highly probable that the thin layer of soil thrown over the surface of the excreta may very readily become impregnated with typhoid bacilli. The filth carts may often be sources from which the disease is spread. And, lastly, clothing stained with specific urine, handed over to the dhobies to be washed, from barracks as well as from hospitals, must also be a frequent source of danger.

61. In urotropine we possess a drug which is a specific in the treatment of typhoid bacilluria, and by the use of which the urine can be rapidly freed, and kept free, of the dangerous bacilli. The desirability of adding this drug to the list authorized for military hospitals is apparent.

62. Ambulant cases of enteric fever must often be a source of dissemination of enteric bacilli by infecting urinals and latrines, and the filth trenches in which their stools are deposited. Even in serious cases the disease is often so insidious in its onset that the affected individual may continue at his duty, sometimes till the disease has reached an advanced stage. These ambulant cases are a constant source of danger, and there can be no doubt that in this way the disease is frequently imported into, and spread in, some of our military stations.

63. In a series of observations by Chantemesse, quoted by Pearmain and Moore, the Eberth-Gaffky bacillus was detected by Elsner's method in the stools of convalescent patients thirteen times in eighteen examinations. But in the light of recent knowledge it would be interesting to know whether or not the stools also contained urine. The bacillus was also detected in the stools of a male nurse in good health who attended typhoid patients. Should this observation be confirmed, the fact that a man apparently in good health can carry the enteric bacillus in his intestines, and thus possibly disseminate it, throws much light on the so-called "spontaneous" origin of enteric fever.

64. Evidence is steadily accumulating which goes to prove that a polluted soil plays a much larger part in the spread of enteric fever in India than is considered to be the case in more temperate climates. The habits of the natives of India for centuries past have been such as to have made fæcal pollution of the soil fairly universal, a pollution which becomes concentrated wherever natives are aggregated into communities, as in towns and villages, and in cantonment and regimental bazars. There is also reason to believe that enteric fever is more common among natives than was formerly supposed, and such cases, when they occur, must contribute their share of specific pollution. The shallow trench system for the disposal of excreta from barracks and cantonments, which began to be adopted in 1895, and which is now almost universal, most also be regarded with suspicion in places where, from scarcity of water, the subsequent rapid cultivation of the surface is impossible, or where strict supervision of the method is not carried out.

While there is also the danger which arises from the trenches being sometimes placed in too close proximity to, or to windward of, inhabited dwellings.

65. The view that enteric fever may be spread, either through the agency of subsoil water or by specifically infected dust, presupposes in the first instance that the *Bacillus typhosus* is capable of remaining in an active condition in the soil for a longer or shorter period, and in the second instance, that it can retain its vitality in the dried condition. Dr. Sidney Martin, in his report to the Local Government Board (1899–1900), states that certain cultivated soils, especially garden soils when sterilized, are favourable to the vitality and growth of the typhoid bacillus, but that it rapidly dies out in virgin or uncultivated soils. Dealing with artificially contaminated unsterilized soils, he finds that if the soil be kept very moist and at a temperature of about 19° to 37° C., it has not been possible to detect the bacillus even after a short period, but he has succeeded in isolating it up to a maximum of 12 days, by keeping the soil drier and at a low temperature (2° to 12° C.). He further points out that "as far as is known the typhoid bacillus has no resting stage. It has no spores, so that if it once dies it cannot be expected to reappear, unless a fresh inoculation occur." With the myriads of typhoid bacilli set free in the urine of convalescents and others in India, the means of freshly inoculating the soil must be constantly present. Dr. Robertson of Sheffield came to the conclusion, not only that *B. typhosus* could persist for long periods in certain soils, but that it could grow to the surface when planted at a depth of 18 inches. The evidence is, therefore, somewhat conflicting, and the question must still be regarded as one *sub judice*, but, as Dr. Houston states* :—"It is to be feared that at best laboratory experiments form an unreliable index of what may occur in Nature. The endemic prevalence of enteric fever in some localities with occasional explosive outbreaks of the disease without any apparent reason, which cannot be traced to any imported cause, are extremely difficult of comprehension unless we assume that *B. typhosus* may exist saprophytically in soil—superficial or deep—or in ground water." With regard to the second part of the question, Flügge and Fischer's experiments show that the typhoid bacillus can resist drying, and Dr. Horton-Smith, in the Goulstonian Lectures (page 19), states :—"If, too, we remember that the bacillus has great power of resisting the effect of desiccation, remaining alive, it may be, for over a year in the dried condition (Schiller), it becomes easy to understand how bacilli eliminated from the body may later pass into the atmosphere in the form of dust and cause disease at long periods after every fresh source of infection has been really removed."

66. The dissemination of typhoid bacilli from a polluted soil is probably brought about in two ways. First, in times of flood following heavy rainfall, surface filth may be washed into water-courses or other sources of water-supply ; or disease germs, present in the upper layers of a porous soil, may find their way into water-supplies by the too rapid percolation of the flood rains, with the failure in consequence of natural filtration, as witness the constant association of the prevalence of enteric fever with the monsoon period at many stations in Bombay and Madras, a prevalence which usually attains its maximum intensity towards the close of the rains. Second, as the result of opposite conditions prevailing, an infected soil may dry, crumble and be converted into dust, and the infected dust being dispersed and carried by the winds, the enteric bacilli find their way into the human body either through being breathed, or by the dust infecting water, milk or food (Davies). As lending support to the air convection theory may be cited the fact that the period of greatest prevalence of enteric fever at most Bengal and Punjab stations occurs at the commencement of the hot weather, before the rains, and when one of the commonest conditions is the prevalence of dust.

67. Direct pollution of the air derived from a polluted soil is not unlikely, and in this way a small localized outbreak which occurred at Cherat in 1897 was accounted for, where a small body of men had been living on, or near, a spot known to have been previously occupied by enteric cases.

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* *British Medical Journal*, 17th August, 1901.

68. Enteric fever often occurs among troops on the line of march as the result of specific or fæcal pollution of the drinking water in the wells of rest-camps, and of roadside villages. As Major Davies, R.A.M.C., points out, "it ought not to be the case that at the present day any drinking-water supplies should be derived from a source directly liable to pollution in this way, and probably it does not often happen, except in the case of wells on the line of march. It is the universal opinion that such wells are sources of danger. From my own experience, I consider that they are most dangerous, because, notwithstanding rules and regulations, they are generally under no sort of sanitary supervision." The danger of such wells is well illustrated by the following instances:—"The 1st Battalion, Black Watch, marched from Umballa to Subathu towards the end of March, 1897, and within three weeks of their arrival at Subathu, 16 cases of enteric fever had occurred (the station having been previously free from the disease). Two companies, which marched with the regiment but went on to Jutogh, developed enteric immediately on arrival there. The Royal West Surrey Regiment, which marched the same road one day in advance of the Black Watch, developed enteric immediately on arrival at Dagshai. The same occurred to the Bedfordshire Regiment, which marched by the same road to Solon some days after the Black Watch." The one condition common to all these different bodies of men is the fact that they all marched along the same route at very much the same period, and the conclusion seems inevitable that the seeds of the disease were picked up *en route*. The water at some of the camps on the march up was reported to be "exceedingly bad," and the medical officer in charge at Subathu remarked "that though every care was taken to boil the water, it is always difficult to check imprudence on the part of hot and thirsty men, and often impossible to ensure cleanliness on the part of native cooks, and other followers, if impure water is at hand."

69. Direct infection from the sick is another way in which enteric fever is sometimes spread. Every year a few cases of this kind are recorded, chiefly among nursing orderlies employed in the enteric wards, but occasionally patients, admitted for other ailments, are attacked. Soiled hands and soiled clothing are doubtless the chief sources of the disease when attendants are attacked, but, in the case of patients, aerial convection appears to be the most probable explanation.

70. The enteric returns of stations are often added to by the admission of men who had contracted the disease elsewhere. In this way a station may occasionally get a name for enteric prevalence that it does not altogether deserve. The importation of cases to stations by troops returned from field service has already been alluded to. It is regularly reported from nearly all hill stations that many of their enteric admissions contracted the disease either at their former stations or during the march up.

71. That gastro-intestinal disturbance predisposes to attack by enteric fever has already been indicated in paragraph 48, while it is a matter of common observation in India that an increase in the admission rate for diarrhœa often precedes or is associated with enteric prevalence, and it is also known that men often suffer from a preliminary diarrhœa before the enteric attack manifests itself. Whether or not the diarrhœa is the expression of the absorption of toxic products produced by the ordinary intestinal bacilli becoming virulent in presence of increased fermentative changes, it is at any rate certain that the diarrhœa implies a more or less altered condition of the intestinal mucous membrane (congestive or inflammatory changes). As Horton-Smith has shown in the case of the bladder that typhoidal cystitis only occurs if the bladder mucous membrane be damaged, so we may expect in the case of the intestine that if the mucous membrane be healthy the typhoid bacilli can pass through without doing harm, but if the mucous membrane be damaged, a specific (typhoidal) enteritis is likely to result. Though having only an indirect connection with the point under discussion, the following cases are of interest as showing how one specific microbe, capable of producing a more powerful toxin, will seize on the ground prepared by another. Cholera appeared in the "Sister's" ward of the section hospital at Mhow in 1900, and seven cases occurred among the eleven patients in the ward; all the men attacked were cases of bowel complaints, while the four men who escaped attack were suffering from

other diseases. In the same year at Secunderabad five enteric patients were attacked in hospital by cholera, with a fatal result in two instances.

72. As the disease steadily increased in prevalence in India, there was necessarily increased production of the specific bacilli and as a matter of course increased dissemination of the disease poison. The chief ways in which the disease germs can be disseminated are through the media of water, air, milk and food.

73. *Water.*—In Europe it used to be at one time almost the universal opinion that polluted water was the only agent concerned in the conveyance of enteric fever; but of late years opinion has considerably changed, and it is now almost as fully recognized that an exclusively water-borne theory will not explain the facts connected with the occurrence of many outbreaks and the many puzzling points relating to the endemicity of the disease in certain areas. In India it has so often been found difficult to trace outbreaks to a specifically polluted water-supply that some observers have even gone so far as to say that the part played in Europe by water is played in India by dust. This is, of course, overstating the case, as there are many recorded instances in which outbreaks were clearly the result of a contaminated water-supply.

74. If typhoid bacilli are almost exclusively water-borne germs, then one would have expected much greater success than has occurred in the reduction of enteric prevalence from the measures taken to ensure pure water-supplies, seeing that these very measures have apparently proved so efficient in the case of cholera that it is now a comparatively rare disease among British troops in India, even when it may be prevalent among the native population near them.

75. It must be remembered that wells, tapping the ground water, bulk very largely as the means by which water-supplies for barracks in India are obtained. In England it is probable that water-supplies are most often polluted by sewage gaining direct access to them. In the majority of the stations in India the conditions are quite different; there are no sewers, and, where wells are the source of water-supply, there are of course no underground water-pipes. It follows that pollution of a well-water must result from (1) a polluted subsoil; (2) wind-borne impurities; (3) filth directly added to the water in the well either accidentally or through carelessness.

76. The evidence in the annual reports, 1898-1900, connected with water-borne enteric in India, may be summarized as follows :—

(1) Taking the experience of 1898, the year in which the highest record of enteric prevalence was reached, the *Bacillus typhosus* was detected in samples of water from Agra, Meerut, Mhow, Bangalore, and Cawnpore. On the other hand, a monthly chemical and bacteriological examination of the water at Rawal Pindi throughout the year was made with negative results, and in the case of the two largest epidemic outbreaks of the year, the Khyber and Quetta epidemics, although repeated bacteriological examinations of the water-supplies were made, the presence of the enteric bacillus could not be detected. Negative results were also obtained in the cases of Chakrata and Ranikhet, where large enteric outbreaks had occurred. Defects or liability to contamination, either at the source or during distribution, were reported from Peshawar, Agra, Mhow, Umballa, Poona, Jubbulpore, Aden, Secunderabad, and Roorkee.

(2) In 1899 the typhoid bacillus was discovered in vessels containing water at Bangalore and Neemuch, in the hut barracks water-supply at Wellington, and in the municipal but not in the barrack water-supply at Agra. An organism closely resembling the *B. typhosus* was detected in April in the water-supply at Umballa. The *B. coli communis* was found abundantly in the water of a well, associated with the occurrence of a small but very fatal outbreak of the disease at Ferozepore (23 cases with 12 deaths) and the same bacillus, or a variety if it, was observed in the course of an investigation as to the cause of outbreaks at Chakrata and Kailana. The liability of uncovered wells to contamination by road sweepings, dust, &c., and

by the introduction of dirty receptacles, is pointed out in the reports from Wellington and Jhansi.

(3) The bacteriological examinations of water carried out during 1900 add little evidence of a positive character to our knowledge of the etiology of enteric fever as it occurs in India. The examination of the drinking-water at Quetta (139 admissions), made by independent observers, yielded negative results; and the same is true of the examinations of the water-supply made weekly throughout the year at Lucknow (63 admissions). At Agra (19 admissions) the results of Mr. Hankin's weekly examinations were negative throughout in the case of the well-water which forms the drinking supply for all the British troops; but the *B. typhosus* was detected in May in samples of water from No. 43 standpost and from the River Jumna; and in a sample from the same standpost in July, and from No. 53 standpost in November; but on those two occasions the bacillus only reacted feebly to typhoid serum. He also found a microbe having some of the cultural characters of the typhoid bacillus, but which did not react to typhoid serum and gave a yellow growth on potato, in 13 samples of municipal pipe-water from standposts in cantonments, and in 12 samples from the lines of the 50th Battery, Royal Field Artillery (this battery furnished 6 of the 19 cases for the year). Here we have an organism closely resembling the typhoid bacillus, but not answering to all the tests, yet apparently standing in a causative relation to cases returned as enteric fever; but the confirmatory test is wanting—a micro-organism having the same cultural characters should have been recovered from the cases (body or discharges)—and of this we have no evidence. A sample of water from the 20th Hussars lines at Mhow, examined by the same observer, was reported to contain a bacillus resembling the enteric bacillus. At Meiktila, where no cases of enteric fever occurred during the year, the *B. typhosus* was isolated in June from the lake water. At Chakrata (13 admissions) the *B. coli communis* was found in the water-supply in August and November, but it was absent in September. The causation of enteric fever is attributed in many instances to the men drinking contaminated water outside barracks, as, for instance, from irrigation canals in a few of the cases at Quetta, from streams in the hills as in a case at Solon, from swallowing water while bathing in a tank as reported in a case admitted at Satara, and while out shooting as in cases reported from Deesa (2), Ahmedabad (1, fatal) and Shwebo (1, an officer, fatal).

(4) Water as the vehicle of the specific bacilli was also reported from many other stations, but in those the source of infection was from the bazars. It is also observed that where liability to contamination of drinking-water is reported, whether at the source of supply or during distribution, the danger of pollution is almost invariably from the *native* population.

(5) On account of the supply of pure water being insufficient for all purposes, certain stations have that dangerous expedient, a double water-supply, a pure supply for drinking and cooking and a separate supply of doubtful purity for washing and ablution. Although special precautions are taken at such stations and the men are warned against the doubtful water, yet it is probable that they often drink it. Two of these stations, Secunderabad and Nasirabad, came into special prominence in 1900 with regard to enteric prevalence during the year, but there is no direct evidence in either instance to connect the wrongful use of the doubtful water with the special prevalence of the disease.

(6) The liability to contamination of water through faulty storage, and the possibility of drinking-water becoming specifically polluted through the agency of wind-borne or insect-borne germs by being kept in open vessels, appear so obvious as to scarcely require mention, but for the fact that it is not uncommon to see uncovered water in cookhouses and to find open gurrahs of drinking-water in barracks.

77. *Aerated waters.*—Typhoid bacilli have been found in aerated waters as long as eleven days after making (Slater). Two cases of enteric fever at Attock, two cases at Meerut, and one each at Calcutta and Bhamo were attributed to the use of bazar-manufactured aerated waters.

The *B. coli communis* was detected in soda-water at Chakrata, and in the sediment deposited on a Pasteur filter used in one of the regimental aerated water manufactories at Lucknow, in both instances in 1899.

78. *Wind-borne germs.*—The fact that the wind may raise particles of fæcal débris from a polluted soil, and thus become a means of spreading disease, has already been alluded to. In the same connection, typhoid bacilluria must be borne in mind, together with the fact that the bacilluric condition persists in many instances for prolonged periods. It is of the highest importance to remember that immense numbers of typhoid bacilli are constantly being set free in urinary discharges alone, in this country as elsewhere, with the result that there must be a widespread dissemination of the specific bacilli constantly going on through urinals, latrines, filth trenches, filth receptacles, soiled ground and linen or clothing stained by infected urine or fæces. In short, numberless foci from which infected dust may be derived are ever present; while there is probably no other country in the world where the climatic conditions for the production and subsequent dispersion of such dust are more favourable. In the old Army Medical Department Reports, the possibility of dust being a carrier of the enteric germ is frequently referred to, and there is now steadily increasing evidence that the air plays a very important part in the diffusion of enteric fever in India. During the great prevalence of enteric fever in 1898 among the American troops, as Munson tells us, flies and infected dust were potent factors in its spread, while contaminated water was considered one of the least important factors. Again, the prevailing opinion from South Africa appears to be that dust-storms and flies were probably of more importance in spreading the disease than directly polluted water-supplies.

79. The air convection theory receives support from the common occurrence of enteric fever at stations in India where dust-storms are prevalent, and where the most careful investigations of the other possible sources of the disease yield negative evidence, including, as in the case of Rawal Pindi in 1898 and Lucknow in 1900, the negative result of the regular bacteriological examinations of the water-supplies made monthly at Rawal Pindi and weekly at Lucknow. Further, the prevailing wind may carry infected dust to barracks by first passing over the filth trenches (Quetta, 1893, and Ahmednagar, 1899) or a municipal filth depôt (Bangalore, 1899).

80. The very serious epidemics of enteric fever which occurred in 1898 at Quetta (232 admissions with 75 deaths) and amongst the Khyber force (238 admissions with 60 deaths) afford strong evidence in support of this view. Both are attributed to dust-borne germs with the added agency of flies. In the case of the Quetta epidemic the evidence is as follows:—

(1) The station was free from enteric fever from January till May, when the usual dust-storms began.

(2) The outbreak was preceded by an epidemic of sore throat, and many of the cases of enteric began with sore throat.

(3) The filth-pits are situated to the windward of barracks, and the epidemic was specially severe in the lines nearest to the filth-pits (the Left Infantry and Royal Artillery barracks), the most probable explanation of the special severity of the disease in these lines being their comparative nearness to the filth trenches and their full exposure to the prevailing wind. This is probably also the reason of the much greater mortality which regularly occurred in the left lines as compared with the right. The following table contrasts the mortality in the two lines from 1890 to 1898 inclusive:—

1890 to 1898.

Lines.	Deaths from enteric.	Deaths from cholera.	Deaths from pneumonia.	Total deaths.	Deaths from enteric. Ratios per 1,000.
Right . ..	32	1	12	87	3·8
Left	114	12	21	214	10·2

(4) The epidemic outbreak of enteric fever at Quetta in 1896 commenced at almost exactly the same period of the year.
(5) The water-supply is exceptionally good, and although repeatedly examined, the enteric bacillus was not found in it.
(6) The principal insanitary condition at Quetta was the position of the filth trenches, which, owing to the scarcity of water, had not been subjected to cultivation for some time.

The causation of the Quetta outbreak was specially investigated by Major Davies, R.A.M.C., who, in his report, says :—"If the supposition that the infection has been contained in the air be correct, it would follow that water, milk and all articles of food exposed to air and dust would be likely to become infected. I am not suggesting that the infection was only breathed in or swallowed in the air, but I feel convinced that this has been the principal channel of its conveyance, and that the main source of the poison was the filth trenches, though latrines, Native and European, may have been concerned as well," and, he adds, "it is the cessation of cultivation of the trench area, combined with the absence of rain in 1898, that has, in my opinion, established the fact of aerial infection." It is of importance to note that the women and children also suffered severely in this epidemic.

81. In 1900 there was another considerable outbreak of enteric fever at Quetta, where, with an average strength of 2,543 men, there were 122 admissions with 29 deaths as compared with 26 admissions and 5 deaths in 1899.

It is a curious circumstance at this station, but one in regard to which I can offer no explanation, that enteric fever shows increased prevalence every second year, at least such has been the case for the last ten years. In the outbreak under consideration, the disease was most prevalent between August and November (119 admissions with 25 deaths), the station having been practically free from the disease in the first half of the year. A detailed description of this outbreak will be found in the Army Medical Department Report for 1900. After the epidemic of 1898 a special sanitary officer was appointed at Quetta, whose sole duties have been to look after the general sanitation. The causation of the 1900 outbreak was exhaustively investigated by the local authorities, as well as by the special sanitary officers (Majors Davies and Elliott, R.A.M.C.) who were sent to Quetta for the purpose. The barracks and cantonments were reported to be models of tidiness and cleanliness, and the general sanitation of the lines to be extremely good as regards cookhouses, latrines for European troops, regimental institutes, &c. In his special report, Major Davies arrives at the conclusion that infected dust dispersed by the winds was again (as in 1898) the most probable explanation of the outbreak. The theory of the air convection of the enteric poison at Quetta receives support from the following considerations :—

(1) Exclusion of other possible sources of the disease after a prolonged and exhaustive investigation.
(2) That although the dangerous condition brought about by the position of the filth trenches in the 1898 outbreak no longer exists, yet, as Major Davies points out, pollution of soil by native latrines has continued, and there were numerous smaller poison centres, in fact wherever there was any aggregation of native latrines.
(3) In the 1898 epidemic the view that the enteric poison was conveyed by wind and dust from the then existing filth trenches, the disease attacking with special severity the neighbouring left infantry lines and artillery barracks, is strongly supported by the fact that in 1899 the artillery were quite free from the disease, while in 1900 they have had few cases in proportion to other corps ; and, further, that during the 1900 outbreak the right lines suffered more than the left, whereas (as shown in the foregoing table) for years before the opposite used to be the case.
(4) The regularity with which enteric fever appears at Quetta in the second half of the year has already been pointed out, and in connection with this fact, the following observation of the medical officer in charge of the station hospital at Quetta is of importance :— I can

only repeat my opinion so strongly expressed in my report of the medical transactions for 1898, and in the same report for 1899, that the dust-laden atmosphere which prevails at Quetta from May to October is a potent factor in the spread of the disease."

82. Major Davies made some experiments in 1898 in the hope of detecting the presence of the enteric bacillus in the air from filth trenches, but without success. The experiments were made at a time of year when dust-storms were not prevalent (November). Though he failed to detect the enteric bacillus, he found large numbers of a bacillus (*Proteus vulgaris*) common in contaminated soil and water, and specially characteristic of fæcal and putrefying matters. This organism has been noticed in several instances in connection with acute gastro-enteritis (see *Medical and Surgical Review of Reviews* for January, 1899, page 43). Up to the present no one has been able to isolate the *B. typhosus* from the air. Three French observers, however, Nollet, Sanglé-Ferrière, and Remlinger, have found it in the dust of barrack-rooms in which cases of enteric fever had occurred.

83. In the case of the Khyber epidemic, dust-storms, swarms of flies, and excessive heat marked the beginning of the outbreak in the end of May, and continued throughout June. It is more than probable that the enteric germs were present in the polluted soil near the camp and in the filth trenches, and being raised by the dust-storms, they were carried by the winds to infect either directly or through the media of food or drink. The measures adopted were—moving the camp chiefly affected; removing the site of the filth trenches to a spot 1½ miles distant; and the provision of galvanized iron tanks for storing the drinking-water. Soon after the completion of these arrangements, the epidemic almost abruptly ceased. Here, again, the enteric bacillus could not be detected in the water, and careful investigation of other possible sources of the disease was attended by negative results.

84. As in 1898, the majority of the cases at Bangalore in 1899 occurred among the cavalry and artillery, although the infantry barracks are less openly arranged and have the native bazar and other buildings surrounding them on three sides, while the cavalry and artillery barracks are built in the open, away from any native buildings but the followers' huts, and are suitably arranged for free perflation of air. In the latter barracks it has been observed that, for the last six years, the rooms which yield the largest number of cases are those nearest the horse lines, which lines are slightly below and to the west or south-west of the barracks. There is nothing insanitary in the condition of the lines themselves, but a short distance to their west runs a long stone sewer leading to the open country beyond, where the sewage is discharged over fields, or rather waste ground. Another even more insanitary spot, also to the west or south-west of the lines and not 500 yards away from them, is, or rather was, a large municipal depôt for nightsoil on the bank of the sewer, where the contents of the night-carts were stored and sold at intervals. This depôt has been open and closed several times during the past few years, and this year (1899) its opening and closing appear to be connected with the increase and decrease of enteric prevalence. The disease is most common during the period of the south-west monsoon, when the wind is of course blowing over these insanitary centres in the direction of the horse lines and barracks, and it is easy to understand that germ-laden dust may be carried to them in this way, a view which explains why the cavalry and artillery are chiefly affected and also why the special prevalence of enteric fever is in the barrack-rooms nearest the horse lines. Another possible source of danger was the use of liquid sewage for irrigating the lucern gardens cultivated for the mounted corps. With the exception of the cases early in January, which were associated with the detection of the enteric bacillus in a chatty of drinking-water used in the horse lines, no case was absolutely traced to its origin. Diminished enteric prevalence in the last months of the year was attributed to the operation of three factors: (1) the closing of the nightsoil depôt in August; (2) change in the direction of the wind; and (3) discontinuance of sewage irrigation.

85. In 1900 the number of admissions at Bangalore was five with one death, against fifty-nine admissions and twelve deaths in 1899. In com-

menting on this large decrease in the usual enteric prevalence, the medical officer in charge remarks :—"Since March, 1895, until this year we had never been without cases in hospital. From June 19th to August 13th no case was under treatment, and again from September 25th up to the end of the year cases were absent." The marked decrease of enteric fever shown during the year was partly attributed to a lessened presence of susceptible individuals, partly to the closure of the nightsoil depôt and the discontinuance of the irrigation of the lucern gardens with liquid sewage (as noted in the preceding paragraph), and partly to the removal of the men (artillery and cavalry), as opportunity arose, from barrack-rooms previously noted as supplying the majority of the cases in other years.

86. *Latrines and urinals.*—The infection of latrines and urinals by ambulant cases, and of urinals by men returned to duty after enteric fever, are mentioned in the reports for 1900 as probable sources of the disease. The carelessness of men in failing to make use of the dry earth provided in the latrines is often pointed out. The carriage of infected stools and urine in the filth-carts, the spilling of small quantities of the contents of these carts (a somewhat common occurrence) on the ground in barracks and on the roads to the filth trenches, and the infection of the trenches by such stools and urine are all referred to in various reports. At Quetta, in 1899, one man attributed his attack to swallowing particles of dust when he was engaged in pulling down an old latrine. In the same year at Chakrata, owing to the contiguity of two latrines to the cookhouses, it was decided to remove them, and this was done between the 18th and the 23rd of May. Although precautions had been taken to disinfect the sites, a small outbreak of four cases occurred in the barrack-room of the Black Watch nearest to the disused sites just before the rains. The men occupying this room used the open space left after the removal of the latrines as a quoit-ground. During the monsoon nothing special occurred, but on the cessation of the rains, enteric fever again appeared in the buildings bordering on the latrine sites and soon assumed the proportions of an epidemic among the young soldiers of the Northamptonshire Regiment. The men occupying the affected rooms were moved to other barracks, and the outbreak subsided as readily as it had appeared.

87. *Insect-borne germs.*—The Army Medical Department Reports furnish a large amount of valuable evidence which goes to show the reality of the danger from flies, and probably other insects also, as carriers of typhoid bacilli. The swarming of flies in latrines, at filth trench sites, on manure heaps, in stables, in horse and cattle lines, and, in fact, wherever collections of filth are to be found, need only be mentioned. Abundance of flies and enteric notoriety are often associated, and it has frequently been noted that flies are present in increased number at times of epidemic prevalence of the disease. Let us consider the evidence for 1900. Faulty situation of latrines in relation to cookhouses, with as a result the possible carriage of the disease germs by flies to food, is mentioned in the reports from Poona and Ahmednagar. Flies and dust were considered important factors in the dissemination of enteric fever at Lucknow. Flies are reported to have been troublesomely prevalent during the height of the outbreaks of enteric fever and cholera at Secunderabad. From Nasirabad it is reported that the filth trenches were constantly disturbed by birds, flies were bred, and the Crowley carts were considered to be a source of danger, partly by bringing flies from the filth trenches into barracks; and it is also mentioned that flies were regarded as the probable carriers of the bacilli to cookhouses and to gurrahs of drinking-water in the barrack-rooms.

Experiment has shown that typhoid bacilli may be carried by flies on their legs and bodies, and it is also stated that the bacilli have been detected in their excreta. There seems no reason to doubt that the results obtained experimentally would equally follow under actual conditions.

88. *Milk.*—Conveyance by milk is regarded as a well established fact in the causation of epidemics of enteric fever in England, but direct evidence is wanting that milk is a frequent vehicle for the germ in India, as soldiers, as a rule, are not large milk consumers. At the same time it must be remembered that the source of many outbreaks has not been traced. The enteric bacillus multiplies in milk enormously faster than in water, and as

milk epidemics usually arise from washing out milk receptacles with polluted water, or from adulteration with polluted water, and as both these sources of contamination are likely to be usual occurrences with bazar supplies, any supply that is brought in from the bazar or from surrounding villages is obviously dangerous. The best example of a milk epidemic in India was one which occurred at Cherat (80 admissions with 21 deaths) in 1897, where the outbreak was attributed to the insanitary condition of the regimental dairies, which were under native control, and the milk from which had been adulterated with water from a dirty tank close to the dairies.

89. *Food.*—From what has been said about milk, it follows that bazar supplies of butter must also be dangerous, with the added danger that natives often work water into the butter to increase its weight. Enteric fever has been known to be conveyed by vegetables grown on sewage farms at home, and as most Indian vegetables are grown on irrigated land, manured with sewage, it is evident that eating carelessly washed uncooked vegetables may be an occasional source of the disease. In one case at Peshawar the cause of the disease was attributed to eating water-cress from a polluted stream, and in another to eating tomatoes which had been washed in foul irrigation water. As a moderate amount of heat (about 20 minutes at 150° F.) kills the enteric bacillus, no cooked food should be dangerous, unless it becomes contaminated after cooking. As Major Davies points out, the conditions of an Indian cookhouse are, as a rule, such as to render this contamination not at all unlikely; the native cooks are generally of low caste, uncleanly in their habits, probably living or associating with sweepers when off duty, and likely to bring in dirt or infection on their persons or in their clothes; and as the old fashion of each soldier having his own particular meal prepared separately according to his own fancy is still more prevalent than the new and much more desirable plan of the men's meals being cooked in messes, there is a great deal of handling of food, the very thing that ought to be avoided. The common practice is that orderlies are appointed from the regiment to supervise the native cooks in their work and to ensure that the kitchens are kept thoroughly clean, but sometimes these duties are carried out in a very perfunctory manner. Mehtars have been found using latrine brooms to sweep the cookhouse floors, although special cookhouse brooms had been provided. Flies are often found in swarms in regimental cookhouses, particularly in those not kept scrupulously clean. Wire gauze doors are specially provided to exclude flies, but these are often left open when food is about, and this is also true of the meat safes.

90. *Bazars.*—The generally satisfactory condition of barracks, the care observed in sterilizing the drinking-water, the supervision bestowed on the selection, source and distribution of water, milk and food supplies, and on every point connected with barrack sanitation and the personal hygiene of the soldier, makes it certain that much of the enteric fever among the troops in India is contracted outside barracks altogether, and chiefly in the bazars. This point has been insisted on year after year in the Army Medical Department Reports. In the returns for 1898 the occurrence of enteric fever in fifteen stations is ascribed either in whole or in part to the bazars. Among the reasons given were—defective sanitation of bazars generally, polluted water-supply, the not overclean habits of the native population, carelessness as to preserving water, milk, and food supplies from contamination, overcrowding, bad conservancy arrangements, and the dirty and careless way in which the making of aerated waters is often carried on; in short, that all the conditions favourable for the propagation of enteric fever exist in most bazars. In proof of this contention is urged (1) the comparative rarity of the disease among the women (of enteric fever age), who live under the same sanitary conditions as the men, and for whom the barrack supplies of water, milk, and food are the same; (2) many instances have occurred in which men admitted for venereal disease have developed enteric fever in hospital, where the period of time that has elapsed would seem to indicate that the two diseases had been contracted simultaneously; (3) instances are recorded in which outbreaks of enteric fever have subsided or have shown great diminution only when the bazars have been placed out of bounds.

91. The bazar source of the disease is of particular interest in connection with the incidence of the disease among young soldiers newly arrived in the country, who frequent the bazars or native city out of curiosity to see new sights, and who, unaccustomed to, or ignorant of, the need of care, take no precautions about what they eat or drink.

92. In many stations a close relation exists between the troops and the bazars through supplies of milk, butter, and aerated waters brought in as barrack supplies. As there is increasing evidence that fever of enteric type is more prevalent than commonly supposed among the native population of the bazars, this is a source of danger, and no doubt one of the causes of enteric fever among the troops.

93. *Enteric fever among natives of India.*—The occurrence of enteric fever among the natives of India was long a disputed point. The fact of its undoubted occurrence is now acknowledged. Every year a small number of cases is observed among the native troops, and every now and then a small series or isolated cases are reported among jail prisoners. Both of these classes are men living under good sanitary conditions; the jail prisoner compulsorily so, while he is at the same time cut off from most outside sources of the disease. No doubt the disease is rare among natives as compared with Europeans, but exact information is wanting with regard to the nature of the fever that occurs among the ordinary native population, and which can give rise to death rates like 40·60 per 1,000, as occurred at Nasirabad in 1900, while at the same place there was a death rate of 21·47 per 1,000 from bowel complaints, and the total death rate from all causes reached the very high figure of 104·06 per 1,000. Other instances of high death rates from *undefined* fevers were observed among the civil population statistics. Such information will be difficult to obtain, as the majority of such cases never come under skilled observation. From time to time undoubted cases of enteric fever are observed, but the number recorded is small. Two cases were observed in native followers at Khyra Gali in 1900, and I have heard of other cases at Mhow and Kirkee which came under the observation of army medical officers in 1901. The settlement of the question as to the real extent of the prevalence of the disease among natives is obviously of great importance. When our water-supplies are contaminated, the source of the pollution is almost invariably stated to be *native* in its origin. The fouling of water during distribution is nearly always through manipulations carried out by *native* labour. The bazar sources of the disease—contaminated water, aerated waters, sweetmeats, food, &c.—can only have a *native* source. The evidence is too strong to doubt the fact that the dangers springing from "native contamination" are real. However undesirable "native contamination" of our water, milk or food supplies may be, unless the pollution is specific in character, the "native contamination" cannot be the cause of enteric fever. The native of India is either commonly the host of the typhoid bacillus or he is not. If he is, although immune in the majority of instances, the explanation of enteric prevalence is easy. If he is not, then we are driven to accept one of two views, either we have been using the phrase "contamination from native sources" too freely, as an explanation of the causation of enteric fever among the British troops in India, or we must accept the view that the ordinary coliform organisms, normally present in the intestines of man and animals, can under certain conditions take on a virulent and pathogenic character.

Preventive Measures.

94. The aim of all the measures that have been taken to combat enteric fever has been to shut off every possible, or even probable, source of infection; but the adoption of effective preventive measures is often rendered difficult by the widespread character of the disease and the frequency of failure in tracing its source.

95. The object aimed at is to provide the soldier with pure air, pure water and pure food, to give him healthy barracks to live in, and to take care that their neighbourhood is also kept in a satisfactory sanitary condition.

96. Bacteriology has come to our aid of late years, and has proved of immense value in helping to trace the origin of outbreaks of the disease, in determining the fitness or otherwise of sources of water supply, and, lastly, it has placed in our hands what will probably in the future prove to be a most effectual preventive measure, namely, acquired immunity against enteric fever conferred by inoculation with anti-typhoid vaccine (Professor Wright's system). Our preventive measures are, therefore, based on (1) excluding or killing the germs of the disease; (2) establishing immunity against it among susceptible individuals.

97. *Inoculation.*—With the short-service system it is manifestly impracticable to alter the age at which the British soldier arrives in India, although it is absolutely certain that many of the men in each fresh regiment or draft will fall victims to enteric fever. When we further consider the facts that, in 1898, 71·41 per cent. of the admissions for enteric fever and 73·39 per cent. of the deaths from it occurred among men between 20 and 25 years of age, that 44·5 per cent. of the admissions and 43 per cent. of the deaths from the disease occurred among men in their first year of service in the country, and that 51·41 per cent. of the total deaths from all causes were caused by enteric fever, the value of any method which will confer immunity against the disease is at once apparent. Anti-typhoid inoculation has now been practised to a considerable extent among British troops at home and abroad, and, so far as the figures have been published, the results are decidedly in favour of inoculation. In India its object is carefully explained to all men arriving in the country, whether they belong to the susceptible period or not, with the view of inducing as many as possible to submit themselves voluntarily for inoculation. In some stations difficulty is experienced in getting the men to volunteer, and in most instances it is found that the men are very reluctant to submit themselves for the second operation, so that, in the main, the results obtained are those following single inoculations only. Had the men been more fully protected by the double operation, the results would probably have been even better. As many fresh arrivals are attacked by enteric fever within a very brief period after landing in this country, I would suggest, as far as such a measure is practicable, that all soldiers, and particularly men under 25 years of age coming to India for the first time, should be inoculated either before leaving England or on board ship.

2.—Measures that have been taken to exclude germs.

98. *General sanitation of barracks.*—Weekly sanitary inspections of all barracks and their vicinities are made by the medical officers in charge of regiments and corps, any defects observed being reported with a view to their early remedy. Annual sanitary inspections are made by the principal medical officers of districts and commands, and annual reports are submitted with regard to the sanitary state of each station. In this way the sanitary condition of every station in India is kept under constant supervision. When outbreaks of enteric fever occur, special investigations are made to trace the source of the disease, and where the cause is obscure, the local authorities are aided in their search by expert bacteriological assistance.

99. Sanitary officers have been appointed to each of the four commands, with their headquarters at Lucknow, Rawal Pindi, Poona and Secunderabad. There is also a fifth sanitary officer at the headquarters office in Simla. These officers perform all the duties that fall to the lot of a medical officer of health at home, and they are charged with the performance of all special sanitary work at stations in their commands requiring the services of an expert sanitarian. In addition to the special laboratories equipped for these officers it has been decided to provide small laboratories for bacteriological work at the headquarters of each district.

100. *Water.*—Great efforts have been made, and are being made, to obtain water-supplies from pure sources, and to protect the water from contamination during distribution. It is obvious that water from even a good source is open to contamination if brought to the distributing points through an open conduit as at Poona. The ideal method of water-supply is a good pipe supply brought from a pure source. Large sums have been

spent in providing piped water-supplies at some stations, and in the construction of filter beds. In very many instances these piped supplies just stop short of being ideal by the pipes not being carried on and brought inside the bungalows and cookhouses, thus leading to the continued necessity of distribution by hand, and the consequent continuance of possible contamination, whether the means of distribution is the objectionable mussack or a metal bucket. Major Davies calls attention to other defects that have tended to nullify the large expenditure that has been undertaken—defective distribution pipes at Poona, intermittency of supply, leading to the use of water from other sources, and at Secunderabad the pipe-supply that has been brought in is not a water that can be recommended as fit for drinking in its present condition. The source of water-supply at Secunderabad is an artificial tank for the collection of rain water (Jeddimutta tank). The collecting area is liable to contamination by animals and natives. In May, 1898, owing to an abnormally dry season, the water became foul and unwholesome, and its use was accordingly stopped, and water was obtained from two deep wells, the source of supply before the tank was built. The well-supply being inadequate, the piped supply has to be used for the supply of ablution and washing water. Wells have again been taken into use at Agra, and the piped supply from the municipal mains stopped, as the result of the inquiry into the causation of the large outbreak of enteric fever in 1897.

101. *Filter beds.*—Where filter beds are in use the source of the sand should be strictly supervised, as at Lucknow, on one occasion, two barges were observed being filled with sand for use in the filter beds from a most objectionable source.

102. *Wells.*—At many stations wells are the only possible source of water-supply. Many are covered in, but some are not. In some places the water is raised by the Persian wheel, and in others bucket and pulley is used, both of which plans are objectionable. Persian-wheel wells may be required for supplying water for horses, gardens, &c., but separate wells should be set apart in all barracks and cantonments for the supply of water for drinking and cooking purposes. All such wells should be completely covered in, fitted with pumps, inspected at regular intervals, and cleaned out when necessary. In cantonments the surroundings of the wells are usually kept in a clean and satisfactory condition. Every year many cases of enteric fever occur among troops marching, and these cases must often be debited to contaminated water, usually obtained from wells at the camping-grounds, but occasionally from wells in the neighbouring villages. Some camp wells are in very good order, but a great many of them, and nearly all village wells, are in a bad state of repair; some with a broken-down coping, others with no coping at all, and all with a hole in it through which the axle of the Persian wheel passes. The bullock-run surrounding the well is often in a most filthy state as is also the end of the axle, and at every turn of the wheel a small portion of filth drops into the water, which thus becomes rich in organic matter and an excellent breeding-place for any germ-laden dust that may reach it. As a large quantity of water is always required for watering horses in camp, Persian-wheel wells may be required for that purpose, but, where possible, separate covered-in wells for drinking and cooking water should be provided.

103. *Sterilization of Water.*—For many years the Macnamara filter was used for the filtration of drinking-water in the barracks and hospitals of British troops in India. An order was issued on the 12th of May, 1896, withdrawing these filters, as they were found not to fulfil the object aimed at. The covered galvanized iron cylinders belonging to the filters were retained for storing drinking water. For filtration, boiling the water was substituted where special circumstances, such as cholera, enteric fever, or a suspicious water-supply, required it, and as an additional safeguard the use of permanganate of potash was sanctioned. Since the end of 1896 the practice has become almost universal, and now at nearly every station in India, to safeguard the men from water-conveyed enteric, all drinking water is sterilized by boiling, and is treated when cool with permanganate of potash, while every care is taken to ensure the absolute cleanness of all vessels in which drinking-water may be conveyed or stored. Of course these precautions may fail in some instances, either from the sterilization being carried

out carelessly, or from faulty methods of conveyance or storage permitting the ingress of infected dust or flies, or from the men themselves deliberately making use of other water for drinking purposes.

104. Mussacks and pakhals should be universally discarded in barracks. Covered metal vessels are now employed, almost exclusively, for carrying drinking-water. Mussacks are still used in watering the roads at some stations, and pakhals are in use for carrying drinking-water at one or two hill stations, as, for example, at Kasauli and Ranikhet.

105. *Aerated waters.*—Regimental factories are now common, and should be encouraged, as they can be kept under supervision. Filters of the Pasteur-Chamberland type should be installed in all factories for the purification of the water used, instead of straining through cloth, which is the common method at present. Bazar factories, although sometimes clean and well managed, are too often the reverse, and bazar supplies on this account are considered to be dangerous.

106. *Milk.*—New regimental dairies have been started, and those already in existence have been more carefully supervised. The institution of Government dairies, as those at Allahabad, Agra, Lucknow, Bareilly, Jubbulpore, Umballa, Aden, &c., must be of the greatest benefit. The milk has in some stations been boiled before issue, or, as at Rangoon, sterilized in an Aymard sterilizer. Where there is no regimental or authorized dairy, the cows should be milked and the butter made in barracks under strict supervision. No supplies should be accepted from an unknown source.

107. *Food and cooking.*—Many improvements have been made in the arrangements of cookhouses. Wire gauze windows and doors have been provided to exclude flies. The native cooks, in some instances, have been supplied with special clothing, and scrupulous cleanliness of their persons and their clothing is insisted on, while they are supervised in their work by cookhouse orderlies. The plan of substituting soldier cooks for native cooks is being tried. In some regiments special sweepers are kept for cookhouse work, latrine sweepers being rigorously excluded. Where latrines and cookhouses have been too close together, one or other has been moved to a distance.

108. *Disposal of excreta.*—Improvements have been made in many instances to remedy defects in the existing method of excreta disposal. Very few places, in either India or Burma, employ methods involving the use of sewers. The Shone system is to be found in operation at Colaba, Karachi and Rangoon, and is considered "practical, scientific, sanitary and economical." The Allahabad system of trenching the nightsoil and afterwards sowing the trenched ground with a quick-growing crop is the plan in general use at military stations in India. This method at all times requires careful and constant supervision, or offensive odours are complained of, and, while the ground remains bare, there is nothing to prevent faecally contaminated, and probably often specifically polluted, dust from getting into the air, possibly with the result of spreading disease, a danger which is intensified if the trenches are situated in the neighbourhood of inhabited buildings, and especially if to windward of them. The Principal Medical Officer, Bengal Command, in his report for 1898, stated that the Allahabad system was unsuitable at all times for damp climates such as Bengal possesses, and for all stations during the rainy season where the soil becomes water-logged, and he recommends the provision of incinerators as desirable for the destruction of excreta at all Bengal stations. The Allahabad system must, in a great many instances, be regarded as an unsatisfactory method of sewage disposal, not only in places where water-logging of the soil occurs during the rains, but also at stations where difficulty is experienced in keeping up cultivation of the trenched surface through scarcity of water, and further, from the dangers that may arise in all stations if the work is not constantly and closely supervised. The question of providing a safe method of sewage disposal is a pressing sanitary problem in connection with military stations in India, and it is one to which much attention has been given during the last three years. Incinerators have been erected in some stations for the complete destruction of excreta and refuse, and incineration would be an ideal plan of excreta disposal if only a perfect incinerator could be found; however, the question must still be regarded as in the experimental

stage. The septic tank system of sewage disposal is also being tried experimentally.

109. *Typhoid bacilluria.*—The same precautions are being taken with regard to the disposal of the urine in enteric cases as are taken with regard to the stools. Soiled bedding and clothing are disinfected, but it would be sounder practice to disinfect the whole of the bedding and clothing used by enteric cases; this procedure is essential in bacilluric cases, and I think it would be safer to carry it out in every case. Separate sets of clothing and bedding, marked E, and intended exclusively for use in enteric cases, are set aside in our home military hospitals; and in 1900 the Hospital Stores Committee recommended that the same course should be followed in India; the necessity is obvious. Nursing orderlies, for their own protection, are warned to thoroughly cleanse their hands before eating, but they should also be regularly reminded of the danger arising from getting their clothing soiled with enteric discharges. A nursing orderly may get urine stains on his ordinary clothing, and we know that some of these stains may contain myriads of typhoid bacilli; I therefore suggest that, while on duty in enteric wards, these men be provided with special outer clothing, which can be disinfected and washed. It is obvious that no patient should be discharged from hospital who is passing typhoid bacilli in his urine, however fit he may otherwise appear to be. Although the presence of bacilli in the urine can often be recognized by naked eye appearances, still bacteriological examination is also necessary, or the presence of bacilluria may escape observation, and therein lies the difficulty. The percentage of cases in which the condition appears and the average duration of bacilluria, as observed in the enteric fever of India, are both points that require urgent investigation, and doubtless, with the large number of opportunities available, the information will soon be forthcoming. Fortunately, urotropine not only rapidly frees the urine from bacilli, but it also appears to have the power of cutting short the bacilluric condition. With the view of preventing the occurrence of bacilluria, Horton-Smith raises the question as to "whether the drug should not be given (30 grains daily) in all cases of typhoid fever, throughout its whole course and during the first three weeks of convalescence, as was first suggested by Richardson." The drug is stated to produce no ill effects when taken in such doses even for a prolonged period, beyond a little urethral pain if the urine becomes concentrated. This treatment may be combined with the ordinary treatment in use in the case. Horton-Smith states that, in the treatment of typhoid bacilluria and cystitis, to be certain of effecting a cure urotropine should be given for a week (10 grains three times a day) though often very much smaller amounts are in reality sufficient. Increased attention must also be given to the prevention of pollution of the ground surface of barracks and camps, and particularly of the ground of urinals and latrines, and their immediate neighbourhood. In some barracks the urine receptacles are now being washed out weekly with a solution of perchloride of mercury, as a routine measure.

110. *Bazars.*—The plan of putting bazars out of bounds has been adopted for some outbreaks of enteric fever, where the source was uncertain, with excellent results. Efforts have been made in several stations (*e.g.*, Mhow, Poona, Rangoon, and Aden) to materially and permanently improve the sanitary condition of Sadr bazars, by opening out congested areas, improving the latrine arrangements, surface drainage, and their sanitation generally.

111. The men are made to fully understand the necessity that exists for boiling all water intended for drinking purposes, and they are constantly being cautioned about the risk they run by being careless as to the water they drink outside barracks.

They are also warned against drinking water from roadside and village wells on field days and on the line of march. Men often drink suspicious water on these occasions, particularly on field days, and this is very hard to prevent, so strong is the temptation to drink the first water one comes across when hot, dusty and parched with an Indian thirst. The men very commonly finish the contents of their water-bottles early in the day, and they often find themselves later a long way off from the water-cart. As a

preventive measure also, a sufficient supply of pure water should always be taken out to rifle ranges for the use of the men at musketry practice.

112. A pamphlet on "Short Rules for preserving Health in India" was prepared for the use of soldiers and their families, and the pamphlets were distributed in 1897 and 1898 to all regiments, corps and hill depôts. If these rules were widely studied and practised by those for whom they are intended, beneficial results must follow in the reduction of preventable disease, and among such of enteric fever.

113. In view of the susceptibility of young and recent arrivals, it would obviously be a good measure not to send a regiment fresh from England, during the first year of its service in India, to a station that has earned notoriety for enteric fever. The same recommendation is equally applicable to drafts, but it is probably not so practicable in their case, as commanding officers like to get these men into the ranks as soon as possible.

114. The continued widespread prevalence of enteric fever implies a certain want of success for the measures employed in combating it. Success, however, depends on the observance of essential details, and detail has often been disregarded. Thus, piped water-supplies stop short of the ideal when hand carriage of the water has to be employed to convey it from the standpipes to cookhouses and bungalows; boiling the drinking-water is often imperfectly done, and the Allahabad system of excreta disposal is not suited to all stations, and it requires careful and constant supervision where it is. Part of the failure is no doubt due to the way in which the application of remedial measures has been attempted. Improvements are commenced in a large number of stations at the same time, and then they have to be stopped before they reach completion through want of funds. Surely it would be better to spend the money over a few stations and so make the improvements complete and thorough.

115. An experiment which, though costly, would no doubt lead to the most satisfactory results would be to select some important but unhealthy station, and systematically improve every detail of its sanitation, irrespective of cost, selecting new sites and reconstructing buildings where found necessary, laying on a pure piped water-supply to bungalows and cookhouses, so that the water comes to the consumer direct without intermediate handling, putting latrines always on the leeward side of barracks, and keeping them and cookhouses long distances apart, establishing incinerators for the destruction of excreta and rubbish, or whatever method of excreta disposal is best suited to the station, and limiting, as far as it can be done, the intercourse between barracks and bazars in the matter of barrack supplies, supplying, in short, pure soil, pure air, pure water, and pure food.

APPENDIX No. IV.

REPORT ON AN OUTBREAK OF ENTERIC FEVER AT DIYATALAWA CAMP, CEYLON, AMONG THE 2ND KING'S ROYAL RIFLES, DURING THE PERIOD THEY ACTED AS GUARD OVER BOER PRISONERS OF WAR.

By Lieut.-Colonel R. H. QUILL, M.B., Royal Army Medical Corps, Senior Medical Officer, Ceylon.

Early in May, 1900, the Colonial Office notified to the Governor that it had been decided to utilize Ceylon for the incarceration of Boer prisoners of war. No time was lost in searching for a suitable site for the large camp which would be required, and after much consideration it was decided by the Governor that a site in the "Happy Valley," 4,600 feet above sea level, and some 4 miles from Banderawella would be a suitable position for the proposed camp.

An ample and pure water supply was obtained from the hills some 3 miles distant, the water being conveyed to the camp from the intake by underground iron pipes. Further, the military camp was erected on a very desirable site, an undulating plateau, commanding the Boer camp but well separated from it. The Boer camp itself was located on a portion of ground surrounded on all sides by little hills: upon these hills were erected guard huts, sufficiently large to accommodate strong guards. This was the outer guard line. The inner line of guards consisted of a number of sentry boxes separated from each other by about 100 yards. These sentry boxes, owing to military exigencies, had to be placed within 20 yards of the fence of barbed wire which enclosed on all sides the Boer encampment.

By the end of July the camps for the Boer prisoners and their military guard were practically complete and the Diyatalawa camp was formally opened on the 30th July, 1900, the military guard some 900 strong, being supplied by the 2nd King's Royal Rifles. On the 9th August the first batch of prisoners, which had arrived at Colombo by the s.s. "Mohawk," reached the camp.

The following table will be found useful. It gives the dates upon which the successive batches of prisoners reached Ceylon, the names of the transports which brought them, and the dates of their arrival at Diyatalawa.

Return showing prisoners of war deported to Ceylon, their numbers and distribution :—

Arrival of Transport. Date.	Name of Transport.	Number of Prisoners.			Date sent to Camp.	Camp.
		Officers.	Men.	Total.		
1900.					1900.	Diyatalawa.
8th August	"Mohawk"	18	225	243	9th August	
9th August	"Orient"*	3	49	52	11th August	
1st Sept.	"Ranee"	*nil*	598	598	2nd Sept.	
5th Sept.	"Bavarian"	11	1,279	1,290	7th Sept.	
8th Sept.	"Dilwara"	12	976	988	10th Sept.	
9th Sept.	"Mongolian"	22	702	724	12th Sept.	
22nd Sept.	"City of Vienna"	11	250	261	25th Sept.	
8th Nov.	"Ranee"	*nil*	241	241	9th Nov.	
1901.					1901.	
9th Jan.	"Catalonia"	19	612	631	10th Jan.	
	Total	96	4,932	5,028		

* This transport brought the 2nd King's Royal Rifles from Natal.

On the 21st September, 1900, one of the Boer prisoners, who had arrived in Ceylon on September 5th by the transport "Bavarian," reported sick ; he was found to be suffering from enteric fever of probably 10 or more days' duration. This was the commencement of an epidemic of enteric fever among the Boer prisoners of war, which quickly assumed formidable proportions. By the end of December, 600 cases had been diagnosed as enteric fever, and during the same period there had been also some 200 cases of simple continued fever, many of which, doubtless, were enteric fever in a mild form. That this epidemic of enteric fever among the prisoners of war had been imported from South Africa, is open to no reasonable doubt. Not only had enteric fever been rife among the Boer forces, but the transports which brought the prisoners to Ceylon had left ports in South Africa (Green Point and Simonstown) where enteric fever was raging. Further, many cases of enteric fever occurred on board the transports during their voyage from South Africa to Ceylon, notably in the "Bavarian," from which vessel alone 9 cases were landed and sent to the General Hospital in Colombo. Thus the chain of evidence connecting the epidemic of enteric fever at Diyatalawa camp with South Africa is complete.

Now to refer to the Military Guard at Diyatalawa, and how they fared while an epidemic of enteric fever was raging in their immediate vicinity :—

As already mentioned the guard was formed by the 2nd King's Royal Rifles, who had arrived in the command from Natal, by the transport "Orient," on the 9th August, 1900. The battalion was sent at once to Diyatalawa, and were, so far as our observation went, in all respects a healthy body of men, no suspicious form of fever of any kind existed among them, and their general health and appearance was excellent. The battalion remained in this satisfactory condition of health until the 18th October, 1900, *i.e.*, for more than two months after its arrival at Diyatalawa.

On the 18th October, a man reported himself sick : he was found to be suffering from fever, which soon proved to be of the enteric type. From that date admissions for enteric fever began to come in at short intervals, until by the 9th December, there had been altogether 24 admissions with 5 deaths.

After the 9th December the admissions for enteric fever ceased.

Now, in attempting to account for this outbreak of enteric fever among the troops at Diyatalawa camp, I may at the outset say that there was no reason to suspect a purely local cause.

In support of this opinion I would advance the following evidence.

1. The soil on which the camp was erected was, so far as could be discovered, virgin soil.
2. The water supply was excellent, being derived from the hills some 3 miles distant and brought into the camp by means of underground iron pipes, to which taps were attached in the camp. The intake in the hills was in an isolated spot, where the chance of the surrounding ground being in any way polluted was very remote. But as an additional safeguard, before the water was used by the troops it was invariably filtered through Pasteur or Berkefeld filters which were placed in every barrack room. The water was subjected to a weekly analysis before filtration, and the report invariably gave the water a very high character.
3. No fresh milk (with the exception of that used in the hospital) was allowed to be sold within the camp precincts. When milk was required, condensed milk was used.
4. All aerated waters used in the camp came from the Ceylon Brewery at Newera Eliya, and were identical with those used in that station. At Newera Eliya there has been no enteric fever.
5. No uncooked food or vegetables were used in camp.
6. No native hawkers of any kind were allowed in camp.
7. All the native shops in the camp, only four or five in number, were under strict military supervision. No aerated or other drinks were sold in them except aerated waters procured from the Ceylon Brewery.
8. The utmost care was taken to keep the latrine in a sound sanitary condition. The buckets were kept sweet by means of a plentiful supply of Izal disinfectant, and were emptied, as a matter of routine, every four hours so as to eliminate all danger from the deposit in them of an unsuspected enteric stool.
9. Large meat safes were supplied to all the kitchens, so that uncooked meat and other provisions might be protected from flies, which were very numerous.
10. The only drains were a few surface ones.
11. The general scavenging of the camp was carefully attended to.

Having thus eliminated any local cause as being responsible for the enteric outbreak in the military camp, I am driven to the conclusion that it was derived from the adjoining Boer camp where, at the time, an epidemic, of enteric fever was raging.

In support of my conclusion I submit the following observations :—

1. Guard huts accommodating strong guards surround the Boer lines, and are in close proximity to them. This for military reasons is unavoidable.
2. The men on sentry duty, during night and day, are posted at short intervals almost immediately outside the barbed wire enclosure which separates the Boer from the military camp. Thus those on sentry duty (a numerous body of men) are in close contact not only with the prisoners but with their latrines, urinals, hospitals and wash houses, all of which are situated at but a short distance from the barbed wire enclosure.

The undesirability on health grounds, of the line of sentries being so close to the Boer camp was fully recognized, but for military reasons it was not found possible to alter the arrangements.

From the foregoing remarks it will be obvious that those on duty in the guard huts and sentry boxes (particularly the latter) must be, to a very appreciable extent, exposed to the emanations arising from the latrines used by the Boer prisoners of war. Now, assuming that such emanations contained enteric germs, not a very far fetched hypothesis when we remember that at the time enteric fever was very rife in the Boer camp, and further assuming, that enteric infection can be received by inhalation,

the possibility, nay the probability, of the enteric infection being thus conveyed from the Boer prisoners to the military guard, appears to be well founded.

3. But even if we "put out of court" the inhalation theory in connection with the conveyance of enteric fever, we have another factor to fall back upon. During the whole period that enteric fever was rife in the Boer camp, flies in that camp amounted almost to a plague, the military camp being similarly infested, though to a lesser extent. Now, as flies are universally allowed to be well adapted for the carriage of infection, it is plain that, under the conditions I have mentioned, there would be nothing to prevent flies, laden with the enteric poison, to migrate from the Boer camp to the adjoining military one, and so convey to the latter the poison they carried.

Let me here anticipate an objection which may be made against the conclusion I have been advocating.

It may be asked, how do you account for the number of cases of enteric fever among the military guard being, comparatively speaking, so few, when their exposure, while on guard duty, to the emanations from the Boer latrines continued? My reply to such a question would run as follows:—

On the Boers first arriving in camp their habits were filthy in the extreme. The very elements of sanitation appeared to be an unknown quantity to them. As time went on owing to much preaching and insistence, a considerable change for the better in their habits of personal hygiene came about. Further, the formidable spread of enteric fever among the prisoners of war moved the civil medical authorities, who were responsible for the sanitation of the the Boer camp, to redoubled exertions. The clothes of the prisoners which, as a rule, were in a filthy condition, were all thoroughly disinfected in a Thresh's disinfector, and the greatest possible attention was paid to the latrines in the way of their thorough disinfection and constant cleansing. The result of all this was a very considerable improvement in the general sanitary condition of the Boer camp, a considerable drop in the admissions among the prisoners for enteric fever, and, as a consequence, a very much diminished danger to the military camp of the conveyance of infection.

Before leaving these considerations connected with the cause of enteric fever, I must refer to an apparent relation between the rainfall and the outbreak of enteric fever under reference. At Diyatalawa the normal yearly climatic condition is a long continued drought from February to October, followed by a heavy rainfall (average 75 inches), from October to January.

Now the first case of enteric fever among the 2nd King's Royal Rifles, occurred in October, *i.e.*, at the outset of the rains, and on the rains beginning to subside in December, so did the admissions for enteric fever commence to decrease.

In the A.M.D. reports, attention has been frequently called to the apparent relation between a heavy rainfall, following a long drought, and outbreaks of enteric fever; the usual explanation of this occurrence has been, that the longer the period of drought, the more organic matter will be accumulated, and the more organic matter the greater the danger of the water supply becoming contaminated. This explanation, so far as Diyatalawa is concerned, does not hold good, for, as has been already stated:—

(*a*) The intake of the water supply was, so far as our close observation went, from a pure source, some 3 miles distant from the camp, where the possibility of the accumulation of organic matter was infinitesimal.

(*b*) From the intake to the camp the water was conveyed in underground iron pipes, all danger of contamination *en route* being thus avoided.

(*c*) Frequent chemical analysis invariably declared the water to be remarkably pure: a similar verdict followed a bacteriological examination of the water.

(*d*) Lastly, before the water was distributed in the military camp, it was invariably passed through a Pasteur or Berkefeld filter.

Bearing these observations in mind, it is difficult to understand what possible relation the rainfall could have had to the enteric outbreak at Diyatalawa. Nevertheless, it must be confessed that the incidence of the enteric fever outbreak with the arrival of the rains, and the subsidence of the outbreak with the cessation of the rains, if only a coincidence, is a very peculiar one.

Before concluding these observations on the cause of the enteric fever which prevailed among the 2nd King's Royal Rifles at Diyatalawa between October and December, 1900, I would draw particular attention to the following facts :—

(*a*) The battalion reached Diyatalawa on the 10th August with a clean bill of health as regards enteric fever.

(*b*) On the 21st September following, the first case of enteric fever occurred among the Boer prisoners of war, this initial case being rapidly followed by others, until a veritable epidemic of enteric fever existed among the prisoners.

(*c*) On the 18th October, that is two months after the arrival of the 2nd King's Royal Rifles at Diyatalawa, the first case of enteric fever occurred in the battalion.

To my mind the conclusion is unimpeachable, that the enteric fever which attacked the military guard at Diyatalawa camp was derived from the Boer prisoners of war, incarcerated in an adjoining camp, and among whom enteric fever existed in an epidemic form.

It may be well to state here the precautions we adopted to prevent the spread of the disease in the military camp.

1. Each morning all men who had been on guard, as they came off duty were carefully inspected ; any man looking ill being questioned as to his suffering from diarrhœa, &c.
2. One company in rotation was daily inspected in place of a weekly inspection of the battalion as a whole.
3. Directions for all men suffering from diarrhœa to report sick at once, were published daily in Company Orders.
4. A Regimental Order was published to the following effect :—
   "All men leaving the camp for purposes of duty or pleasure will take with them water bottles filled with filtered water."
5. A large meat safe was placed in each kitchen for the protection from flies of meat and other food supplies.
6. A Pasteur or Berkefeld filter was placed in each barrack room, their care and general supervision being undertaken by the Royal Engineers.
7. No aerated or other drinks were sold in camp except those made in a recognised manufactory for mineral waters.
8. No hawkers of drinks or foods were allowed inside the camp.
9. The latrines were daily inspected ; the following directions in regard to them being carefully carried out :—
   (*a*) A 10 per cent. solution of Izal to be placed in each latrine, under the care of the pioneer sergeant, with directions that one pint of the solution be poured into the bucket when empty, and a second pint when the bucket is being removed for emptying purposes.
   (*b*) The buckets to be emptied regularly every 4 hours. In addition to the foregoing precautions, means were adopted to exclude all flies from the hospital wards.

The following summary of clinical notes on the cases which occurred are of interest.

They were under the charge of Major S. J. W. Hayman, R.A.M.C., who was in medical charge of the camp.

Forty-three men of the 2nd King's Royal Rifles had been inoculated against enteric fever. None of those men contracted the fever.

From an examination of the temperature charts it may be questioned whether all the 24 cases were undoubted examples of that disease.

The temperature range in eleven of the cases, was certainly not that which we are accustomed to associate in temperate climates with enteric fever. Indeed, the only symptoms in those cases at all characteristic of fever of the enteric type was the presence of rose spots, with, in some cases, suspicious diarrhœa. But before dismissing the cases named as having little or no title to be classed as enteric, we must bear in mind the following considerations:—

(*a*) The cases occurred when enteric fever was prevailing in an epidemic form.

(*b*) In all the cases disproportionate anæmia and debility followed; convalescence in consequence, being very slow, and entirely different from the convalescence following genuine cases of simple continued fever.

(*c*) Lastly, many similar cases occurred among the Boer prisoners of war, and were, in the first instance, returned as simple continued fever: but on a bacteriological examination of the blood being made in connection with Widal's test, the clumping action of the serum on the actively motile enteric bacilli was marked.

My own impression is that the cases under reference were examples of that "abortive or incomplete form of enteric fever" which so frequently occurs when the fever is prevailing epidemically. Such cases require to be managed with all the care which we are accustomed to bestow on typical cases of enteric fever.

Another case, which Major Hayman, from the symptoms present, had not suspected to be of the enteric type, I look upon as an excellent example of the ambulatory form of enteric fever. The man was not admitted to hospital at his own request, but because he was noticed by Major Hayman not to be looking well. He complained of nothing in particular, only feeling languid and generally "not himself." His temperature on the morning of admission was normal, but on the evening of the same day it was 101° F.; and this range of temperature, *i.e.*, normal in the morning and 101° or 102° in the evening continued until his death, 13 days after admission. He was probably well on in the second week of fever when admitted, for at the *post mortem* examination the pathological condition of the intestine showed evidence of the fever being probably in the fourth week. The case is a very instructive one.

In bringing this report to a conclusion it is submitted that taking into account the very formidable epidemic of enteric fever which raged in a camp adjoining the military one, there is good reason for being content with the small number of cases which occurred among the troops. The total strength of the military guard was 900, among whom 24 cases of enteric fever or 2·66 per cent. occurred.

APPENDIX No. V.

FIRST ANNUAL REPORT OF THE PASTEUR INSTITUTE OF INDIA, KASAULI, FROM 9TH AUGUST, 1900, TO 9TH AUGUST, 1901.

By Major D. SEMPLE, M.D., D.P.H., R.A.M.C., Director.

I.—STATISTICS.

The Pasteur Institute of India (which I believe has the distinction of being the first Institute of the kind in the British Empire) was opened at Kasauli on the 9th August, 1900, for the treatment of persons bitten by rabid animals. During the year 321 persons have undergone anti-rabic treatment. For statistical purposes, and also for purposes of comparison, the patients treated are divided into three classes, similar to the classification adopted at the Pasteur Institute, Paris, and at other Institutes :—

Class A.—Those bitten by animals proved to have had rabies, either experimentally, or by the development of the malady in other persons or other animals bitten by them.

Class B.—Those bitten by animals certified by a veterinary surgeon to have had rabies, after examination either before or after death, or both.

Class C.—Those bitten by animals suspected of rabies.

Each of these classes is again divided into three sub-classes :—

Sub-Class I.—Those bitten on the head or face.

Sub-Class II.—Those bitten through the exposed skin on any other part of the body.

Sub-Class III.—Those bitten through the clothing.

The numbers in the different classes and sub-classes, together with the totals and percentage mortality in each division, are given in the following tabular statement :—

Classes.	Sub-Class I—Bitten on the head or face.			Sub-Class II—Bitten through the exposed skin on any other part of the body.			Sub-Class III—Bitten through the clothing.			Totals.		
	Treated.	Deaths.	Percentage mortality.	Treated.	Deaths.	Percentage mortality.	Treated.	Deaths.	Percentage mortality.	Treated.	Deaths.	Percentage mortality.
Class A, proved rabid.	12	0	0	52	2	3·84	7	0	0	71	2	2·81
Class B, certified rabid.	3	0	0	42	0	0	6	0	0	51	0	0
Class C, suspected rabid.	14	1	7·14	134	0	0	51	0	0	199	1	·52
Total ...	29	1	3·44	228	2	·87	64	0	0	321	3	·93

As regards their nationality, the numbers are—

Europeans		146
Men	104	
Women	18	
Children	24	
Natives		175
Men	140	
Women	7	
Children	28	

There were no cases of failure amongst the Europeans treated. As regards the classes of the population, the numbers are—

British Army		96
Officers	20	
Non-Commissioned Officers and men	60	
Officers' wives	3	
Officers' children	4	
Soldiers' wives	1	
Soldiers' children	8	
Native Army		25
Officers	2	
Non-Commissioned Officers and men	23	
European Civilians		50
Native Civilians		150

Of the European civilians twelve were Government servants, and of the Native civilians twenty-two were in Government employ. The native patients were represented by all the different religious castes of the country, Hindus and Muhammadans being about equal in numbers. The deaths given in the foregoing tabular statement represent the failures only, and do not include those who contracted the disease during treatment or within a period of fifteen days after the last inoculation (see list appended to this report). These are not reckoned as failures owing to the fact that their nerve centres became invaded by the virus of the animals that bit them before treatment was completed.

A few explanations are necessary to make clear the reasons for this statement:—

1. The virus of rabies implanted in the wound inflicted by the bite of a rabid animal reaches the nerve centres (brain and spinal cord) by growing along the nerves from the seat of the bite. When it reaches the nerve centres it has an incubation period of fourteen days, *i.e.*, a period of fourteen days elapses before the first symptoms set in. The usual incubation period of a dog's, jackal's or wolf's virus is fourteen days, when implanted on the surface of a rabbit's brain. Under exceptional circumstances and in exceptional cases it may be a few days more or less.

2. The object aimed at in treating a person bitten by a rabid animal is to confer immunity against rabies before the virus of the animal inflicting the bite has reached the nerve centres. If this can be accomplished, the failures rarely exceed 1 per cent., and they may be as low as ·5 per cent., or even lower. On the other hand, should the virus have already reached the nerve centres by the time the patient arrives for treatment, or should this happen at any time before the completion of the treatment, the patient will not be saved.

3. A patient who shows the first signs of hydrophobia, say on the sixth day of treatment, is a patient who arrived for treatment eight days after the virus of the animal inflicting the bite had already reached the nerve centres. A patient who shows the first signs of hydrophobia, say thirteen days after the last inoculation, is a patient in whom the virus of the animal inflicting the bite had reached the nerve centres one day before the last inoculation was given, and consequently two days before treatment was completed. Treatment is not really completed until the day after the last inoculation, because it requires a day at least before a patient derives the benefit of an inoculation. This is why fifteen days and not fourteen are given as a time limit within which patients showing the first signs of

hydrophobia after treatment are not reckoned as failures, although fourteen days is the usual incubation period of the "virus of the streets", when planted on the surface of an animal's brain or when it reaches the brain by growing along the nerves from a wound. The proofs of these statements are based on experiments made on dogs with rabies virus. From these experiments we are justified in stating that a patient who shows signs of hydrophobia during treatment or within fifteen days after the last inoculation is a patient whose nerve centres had been invaded by the virus of the animal that bit him, either before treatment was commenced or in any case before it was completed. The practical application of these facts may be summed up in a few words.

Persons bitten by rabid animals should come for treatment as soon as possible, not a day, not even one hour should be unnecessarily wasted. This applies more especially when the bites are situated on the head, face or neck, or on any part of the body where nerves are plentiful. The nearer the bites are to the brain the shorter the distance the virus has to grow along the nerves before it reaches the nerve centres, and consequently the time for successful treatment in these cases is limited. When the bites are deep or numerous, and inflicted through the exposed skin, more virus has been implanted and more nerves infected.

All these are points which indicate prompt and early treatment in order to ensure success.

II.—Technique of Treatment.

It is not my intention to enter into a description of hydrophobia in man or rabies in animals, nor is it necessary to enter into all the details of Pasteur's system of prophylactic treatment. I have, however, reason to believe that the general public are interested in the treatment as carried out in India, and on this account a few details may not be out of place. The treatment is entirely prophylactic, and consists in the daily hypodermic inoculations of rabies virus of increasing strengths, commencing with a very weak virus, and gradually going on to a very strong virus.

By *rabies virus* is meant the unknown entity which gives rise to rabies. There can be no reasonable doubt but that it is a living germ, which has as yet remained undiscovered.

Virus is a convenient term for any disease-producing material about which we know little or nothing. In this sense of the term we speak of small-pox virus, scarlatina virus, rabies virus, and many others. In the case of rabies virus we know that it is found in the brain, spinal cord, medulla, cerebro-spinal fluid, certain of the peripheral nerves, salivary glands, and saliva of men and animals suffering from the disease. Material from any of these sources is capable of conveying the disease to animals. We also know that it is very sensitive to heat; a temperature of 50° C. is sufficient to destroy it. It remains active for months in neutral glycerine, and it can also be kept for a considerable time at freezing temperature. Most of the usual bactericidal agents generally employed also act injuriously on rabies virus. It is very sensitive to drying, and advantage is taken of this fact to diminish its virulence. In some animals it takes on a more virulent form than in others. In rabbits, for instance, after a series of passages from animal to animal, it takes on its most virulent form, and then remains at a fixed strength. In this condition it is known as "Pasteur's fixed virus," the strongest rabies virus obtainable. In dogs the virus behaves in quite the opposite way. When passed from dog to dog, the virus diminishes in strength, and after a series of passages at last becomes incapable of producing the disease in these animals. Under these conditions it is difficult to understand why rabies virus does not die a natural death as far as dogs are concerned. Probably other animals come to the rescue, and prevent this from happening. Advantage is taken of the foregoing facts in the preparation of rabies virus of a fixed strength, or in other words, *rabies vaccine*.

By the term *vaccine* is meant nowadays a virus of fixed strength, or of fixed virulence. In this sense of the term we speak of typhoid vaccine, plague vaccine, cholera vaccine, small-pox vaccine, anthrax vaccine, &c.

We also speak of the inoculation of these vaccines as "vaccination." In the preparation of rabies vaccine it is found convenient to use the spinal cords of rabbits which have succumbed to rabies after inoculation with Pasteur's fixed virus. The spinal cords of rabbits are used because the rabies virus is present in them and in its strongest form. When the spinal cords are removed from these animals it is necessary to dry them over caustic potash in glass jars, kept in the dark, and at a temperature of about 22° C. (72° F.). Drying diminishes the virulence of the virus. The caustic potash absorbs moisture from the air, and enables the cords to dry quicker. The absence of light means the absence of a bactericidal power which under these conditions can be dispensed with. At a temperature much below 22° C. the virus in the cords would lose in virulence too slowly, and at a temperature much above 22° C. too quickly. When a cord has been in the drying room under the above conditions for fourteen days the virus has become so attenuated that it is incapable of conveying rabies to animals when given in the usual doses. Under similar conditions a cord dried for three days contains virus almost (if not quite) as strong as a fresh cord. The strength of the cords between the fourteen and three-day cords is proportionate to the time they have been dried. The first or weakest vaccine is always made from a cord which has been dried for fourteen days, and the strongest from a cord which has been dried for three days. It is thus possible to have a series of vaccines gradually increasing in strength.

The rabbits used are healthy full-grown animals in good condition and as near as possible of the same size. They are inoculated on the surface of the brain (under the dura mater) with about one or two drops of an emulsion of fixed virus prepared immediately before use from the medulla of the rabbit whose spinal cord has been removed that day. During the operation they are completely under the influence of ether. A small longitudinal incision is made through the skin on the top of the head to expose the bone. The incision is then held open, and a circular trephine applied about ¾-inch behind the eyes, a little to one side of the median line, and a small piece of bone removed which exposes the dura mater (membrane covering the brain). The needle of the syringe containing the virus is now introduced in a slanting direction, just through the dura mater, and about $\frac{1}{10}$ cc. injected over the surface of the brain, not into its substance. As the needle is withdrawn a pledget of cotton-wool is applied for a few seconds to prevent oozing. The edges of the skin wound are brought together with a few stitches, and sealed up with collodion, aseptic precautions being strictly adhered to. The operation takes about five minntes, including the administration of ether, and within the next three to four minutes the animal has completely recovered from the effects of the ether, and eats in its cage, suffering no pain whatever.

During the first six days it remains quite well and eats its food as if nothing had happened. On the seventh day it gets a commencing paralysis in the muscles of the back and legs. This paralysis goes on increasing until the tenth or eleventh day at most, when the respiratory muscles become involved, and the animal dies. They eat their food up to the eighth or ninth day, and evidently suffer no pain from beginning to end. After death the spinal cord is removed under the strictest aseptic precautions, divided into two or three equal portions, and hung with sterile silk threads in sterile glass jars, containing some caustic potash. Each jar is labelled with the number of passage, region of cord, date and hour, and at once placed in the dark drying room. When the cord is exposed, previous to removal from the spinal canal, a cultivation is made from it to make sure whether it is free from contaminations of any kind. If the culture medium remains sterile after a day or two days' incubation, there has been no contamination, and the cord may be safely used for the preparation of vaccine.

After the removal of the spinal cord, a small portion of the medulla from the floor of the fourth ventricle is made into an emulsion, to be used in inoculating a fresh rabbit, so as to keep up the series. Every day the spinal cord is removed from a rabbit which has died from rabies, and every day a fresh rabbit is inoculated (two rabbits when the patients are over 30 in number). In this manner a supply of cords is kept up for inoculation

purposes. The quantity of cord used for a single dose for an adult is 1 cm. in length or about one-third of an inch. This is ground down in a sterile conical glass with a sterile glass rod, and sterile fluid added to the extent 2·5 or 3 cc. It is then in the form of a greyish coloured fluid, and can be easily filled into a syringe. The fluid used in making the cord emulsions is distilled water, with ·75 per cent. sodium chloride added.

The patients are inoculated at 10·30 a.m. daily. The vaccines are made up immediately before use, all details of treatment having been previously arranged the same morning. The patients file into the inoculating room in the order in which their names are called. Those receiving the weakest vaccine are inoculated first, and those on the strongest vaccines last. In this way one syringe can be used to inoculate all the patients, provided care is taken to sterilize the needle only between successive inoculations. The inoculations are given hypodermically on the side of the abdomen, between the crest of the ilium and the last rib. The skin is first of all cleansed with a pledget of cotton-wool steeped in carbolic lotion, then a fold is pinched up between the finger and the thumb, and the needle of the syringe introduced into the subcutaneous tissue only, and the requisite amount of cord emulsion injected. On withdrawing the needle the part is again rubbed gently with a pledget of cotton-wool dipped in carbolic lotion, to prevent oozing, and to stimulate the skin to contract, so as to close the needle puncture. Every detail connected with the preparation of the vaccines and their inoculation is carried out under complete aseptic principles, and as a result there has not been a single abscess during the year. All details connected with the circumstances under which the patients were bitten and the treatment received are entered in treatment forms (see list at the end of this report). The treatment varies according to the information elicited on questioning the patients on their arrival, and is not necessarily the same in any two patients.

The points taken into consideration in putting a patient on a line of treatment are—the number, depth, and seat of the bites; whether bitten through the clothing or the exposed skin; whether the wounds have been effectually cauterized or not; the time that has elapsed before coming for treatment; the evidence as to whether the animal inflicting the bites suffered from rabies; also the species of the animal, and the state of the patient's health. On considering these points, some idea is arrived at as to whether the patient received a large or small amount of virus when bitten; whether the virus may be reasonably suspected of having reached near to the nerve centres; and consequently whether it is necessary to hurry up the treatment as much as possible. During the early stages of the treatment when the vaccines are weak, two inoculations may be safely given at the same time, one on each side, but later on, when the vaccines are pretty strong, it is not advisable to give two inoculations at the same time, until the patient has had the strongest vaccine of all. Persons undergoing the treatment are not ill in any sense of the term. They can go about much as usual and without any inconvenience. It is, however, not advisable to take violent exercise, or to indulge too freely in alcoholic drinks, otherwise the seat of inoculation is liable to become tender and swollen.

On completion of the treatment each patient is given a stamped and directed post-card. On the reverse side is his or her serial number, name, corps, and residence. The cards are antedated three months, and a blank space is left for signature and state of health. On leaving the Institute the patient is told to fill in state of health on the date given, and to sign and post the card. On receipt of these cards an entry is made on the treatment form to that effect. This arrangement gives patients or their friends every facility to communicate results three months after completion of treatment (see copy of treatment form appended).

III.—Method of Obtaining Fixed Virus.

When starting an anti-rabic Institute, it is absolutely necessary to have the strongest rabies virus obtainable, *i.e.*, "Pasteur's fixed virus," in order to inoculate the first series of rabbits whose cords are to be used in the preparation of vaccine. After this the virus is kept up by passages from rabbit to

rabbit, and remains at the same fixed virulence indefinitely. There are several ways in which this virus can be obtained from an institute already in working order, but only one way in which it can be obtained in the first place, viz., Pasteur's method.

1. Pasteur's method of obtaining fixed virus.—A portion of the brain, medulla, or spinal cord of a rabid animal, such as a dog, jackal, wolf, or other animal, is used to inoculate a rabbit subdurally. On the fourteenth day, as a rule, this first rabbit shows commencing paralysis, and dies from paralytic rabies on the eighteenth or twentieth day. A second rabbit is then inoculated from the medulla of the first. This second rabbit shows commencing paralysis a little earlier than the first, and dies sooner. A third rabbit is inoculated from the second, and so on, until at last after a number of passages (ten to twenty, or more) a rabbit shows commencing paralysis on the seventh day, and dies on the tenth or eleventh day. The virus is then up to strength, and remains so indefinitely when carried on from rabbit to rabbit, and is known as "Pasteur's fixed virus." It is now fit to be used to inoculate the first series of rabbits, preparatory to making vaccine. This method requires several months, probably five or six, or even more, and can only be undertaken when a rabid animal is at hand to supply virus to begin with. On this account it might cause considerable delay.

2. A portion of the brain or medulla of a rabbit which had died from rabies due to "fixed virus" could be obtained in neutral glycerine from any Pasteur Institute. This method answers very well, provided the temperature during transit is not too high. On its arrival a few passages through rabbits would have to be made in order to recover the virulence lost during transit. If at any time during the journey the temperature remained at 100° F. for four or five days, this would mean complete destruction of the virus, and the object in view would be defeated.

3. A rabbit could be inoculated with "fixed virus" at any Pasteur Institute, and then brought to where it was proposed to start an Institute. On the animal's death the series could be started at once. If the distance was long (from Europe to India for instance) it would be necessary to inoculate a second rabbit on the death of the first, and probably a third, fourth, and fifth, during the journey. This is an expensive and inconvenient method of getting virus from Europe, but in other respects it is faultless.

During the first six months the virus used at this Institute was in the first place obtained from Dr. Calmette, Director of the Pasteur Institute of Lille, by the second method described above. In March, 1900, I wrote to Dr. Calmette for "fixed virus," and he very kindly sent me a brain and medulla from his institute in neutral glycerine. The virus arrived at Kasauli early in May. When tested on rabbits, it was found that it had lost considerably in virulence during the journey from Lille, due no doubt for the most part to the high temperature in the Red Sea. A series of five passages was necessary to regain the virulence lost in transit. This took two months, and at the end of that time it was fit to be used to inoculate the first series of rabbits. In the meantime I had also applied to Dr. Duclaux, Director of the Pasteur Institute, Paris, for "fixed virus," and he very kindly sent me a brain and medulla in neutral glycerine. Unfortunately the Paris virus had lost the whole of its virulence during transit, as the weather at the time was very hot in the Red Sea, and in India. Several rabbits inoculated with it remained healthy. Since February, 1901, the vaccine used at the Institute has been prepared from Indian virus.

In July, 1900, a dog suffering from rabies was destroyed in Kasauli. On experimenting with a portion of his brain it was found that a rabbit inoculated showed paralysis on the fourteenth day, and died from typical rabies on the eighteenth day. After a series of fifteen passages, paralysis commenced on the seventh day, and the animals died on the tenth or eleventh day. The virus was then up to strength, and quite as strong as that obtained from Lille. A few extra passages were continued to make sure on this point. The object in using Indian virus is the possibility that it may be stronger than European virus. If this is the case, the advantages to be gained by using it to treat patients bitten in India are evident. In any case it is certainly not weaker, and there is nothing to be lost by using it in preference to European virus, but possibly something to be gained.

Assuming that the virus of rabies is more virulent in India than in Europe, it is only reasonable to expect that a higher degree of immunity could be conferred by using the same virus to vaccinate patients bitten in India. Although this virus has only undergone thirty-eight passages, many of the rabbits inoculated now show commencing symptoms of paralysis on the sixth day instead of on the seventh, which is the usual time for Pasteur's fixed virus (European fixed virus) to cause commencing paralysis in a rabbit. When it reaches the fiftieth or sixtieth passage it may possibly cause commencing paralysis on the sixth day in all cases. This is a point which remains to be seen, and is an important point in the treatment of cases in India.

IV.—FACTORS CONNECTED WITH THE ANTI-RABIC TREATMENT OF NATIVES IN INDIA, NOT MET WITH TO THE SAME EXTENT AMONGST EUROPEANS, EITHER IN INDIA OR IN EUROPE.

There are several factors connected with the anti-rabic treatment of natives in India, which render it more difficult to carry out with the same success met with amongst Europeans, either in India or in Europe.

1. At all times of the year Europeans wear a considerable amount of clothing, whereas the natives of India wear very little clothing, and consequently when attacked by a rabid animal they are as a rule severely bitten, and through the exposed skin.

2. Jackals in India suffer a good deal from rabies, and when they attack people they bite very severely, in many cases holding on until they are choked off. On this account alone their bites are more dangerous than a dog's. It is also believed that a rabid jackal's saliva contains more virus than the saliva of any other rabid animal, and that it is in addition more virulent. Untreated, the percentage of deaths after jackal bites are much higher than after dog bites, the mortality being about 85 per cent. From the results of the treatment of a batch of over 30 patients bitten by rabid jackals, after the 9th August, 1901 (the details of which do not belong to this report, but will appear in the next), I am convinced that the ordinary line of treatment, sufficient for dog bites, is not sufficient for cases of this class, and that it will be necessary to treat all cases of jackal bites by a method almost as severe as the intensive method, no matter how few the bites or on what part of the body they are situated. Jackal bites require more rigorous treatment than dog bites.

Pasteur came to a similar conclusion in regard to a batch of Russians bitten by wolves, and who underwent treatment at the Pasteur Institute, Paris, soon after it was started. I feel convinced that Pasteur's conclusions as regards wolf bites in Europe are equally applicable to jackal bites in India. These are facts which could only have been recognized by experience. In future it will be necessary to reckon with them as factors in the treatment of such cases.

3. A native as a rule allows a considerable time to elapse before coming for treatment, unless he receives European advice and acts on it. Early treatment is a most important factor in all cases.

4. In very few cases are their wounds cauterized. On the contrary, many of them apply native remedies, and arrive with their wounds suppurating and neglected. These factors do not hold to the same extent in Europe, or with Europeans in India.

5. Whether rabies virus is more virulent in India than in Europe, and whether natives are more susceptible than Europeans, are points which I am trying to clear up. My opinion at present is that the virus is more virulent in India, and that natives are much more susceptible than Europeans. The high degree of virulence is probably kept up by the numerous jackals present everywhere in the country, and also to a certain extent by wolves, and possibly other wild animals.

6. There are also climatic difficulties to be overcome in connection with drying the spinal cords for the preparation of vaccine. During part of the year the air is very dry and the temperature high. When the rains set in the temperature is not so high, but the air is almost saturated with moisture. In the winter season the temperature may be low at times, but otherwise the condition of the atmosphere gives no trouble. After some

little difficulty at first it was found quite possible to keep the room in which the spinal cords are dried at an equable temperature throughout the year, and to overcome either the too moist or too dry condition of the atmosphere. It is quite easy to overcome a low temperature in a room by heating it, but a much more difficult task to overcome a high temperature by cooling, when light and moisture have got to be excluded. On this account alone it would be extremely difficult to carry out anti-rabic work in the plains. To keep the drying room at a temperature of 22° C., all the year round, would almost be an insuperable difficulty in any plain station in India. The virus of rabies being so very sensitive to heat, it is absolutely necessary that the room in which the spinal cords are dried should be kept at a temperature of about 22° C. all the year round (never below 20° C., and never above 24° C.).

V.—Period of Treatment and Accommodation.

The course of treatment lasts from eighteen to twenty-one days, according as to whether the patient is severely bitten or not, and is free to all comers. In some cases, such as severe bites on the face, it is necessary to extend the treatment a few days longer. Patients are not accommodated in the Institute. They attend once a day at 10.30 a.m. for treatment, and, with the exception of British soldiers, make their own arrangements as regards food. British soldiers are accommodated in the station hospital, and native soldiers in a house in the bazar.

A generous and charitable-minded native gentleman, Lala Ghunta Mian, residing in Kasauli, presented to the Institute a large house in the bazar, containing sixteen rooms, for the accommodation of the poorer class of native patients irrespective of caste. The difficulties connected with the housing of these poor people have been in this way overcome.

Well-to-do Europeans and natives have no difficulty in finding accommodation, as there are several hotels and boarding-houses in Kasauli. A boarding-house or houses for the accommodation of patients who cannot afford hotel prices is badly wanted.

Many of the native patients arrive with the idea that they are coming to a hospital, and that they have to remain in bed during the whole course of treatment. They seem agreeably surprised on learning that this is not the case, and that they can go about as usual. During the winter months the poorer class of native patients arrive with very little clothing, and no means to purchase more. Khan Bahadur Dhanjibhoy, C.I.E., Rawalpindi, has very generously come forward with an offer to supply blankets and warm clothing at his own expense for this class of patients, also food if necessary, and has enabled a pressing difficulty to be overcome. The same gentleman has also contributed largely towards funds for the preparation of anti-venomous serum.

VI.—Method of sending a Portion of Brain or Spinal Cord from a Suspected Rabid Animal for Diagnostic Purposes.

When sending a portion of the brain or spinal cord from an animal suspected of rabies, the best plan is to send it in sterile neutral glycerine. A small portion of the brain, about the size of a bean, is quite sufficient, and it answers just as well as the spinal cord or medulla, and is much easier to remove from the suspected animal. The easiest method of obtaining a sample of the brain rom a dog, jackal or wolf is as follows:—Incise the skin down the centre of the head, and dissect back the skin and temporal muscle on one side, so as to expose the bone in the temporal region. A few taps with a chisel and mallet split up the bone. One of the fractured pieces can be easily removed, and the dura mater expo-ed. The dura mater is then incised with a sterile scalpel, and a small portion of the brain scooped out and put in a small bottle of sterile neutral glycerine. Aseptic precautions should be observed throughout. This operation only takes five to six minutes and supplies sufficient material for test purposes.

During the cold weather season it is only necessary to pa:k up the bottle safely and send it at once. In the hot weather season, when the tempera-

ture in the shade is over 90° F. the glycerine bottle containing the brain matter should be packed in ice, because rabies virus in glycerine is very sensitive to a temperature over 95° F. In June and July several samples of brain matter were sent in glycerine, from different parts of India, for test purposes. Experiments made with them gave negative results, although the animals from which these samples were taken showed unmistakable signs of rabies. The temperature in the plains was at that time very high, over 100° F. during the greater part of the day, and probably not below 100° F. at any time during the twenty-four hours. Most of the samples took over three days in coming, so that their contents were probably at a temperature of 100° F. for three days at least. The only reasonable explanation of the negative results was that the virus had lost its virulence in glycerine at the temperature prevailing in the plains at that time, viz., 100° F., or more.

I then made the following experiments to clear up this point :—

Experiment I.—The medulla from one of the series of rabbits which had died from fixed virus (the incubation period of which is seven days) was put in neutral glycerine, and kept in the incubator at a temperature of 99° F. for three days. A rabbit inoculated subdurally with a portion of this incubated medulla remained healthy for thirty-eight days, and then developed rabies, and died on the fortieth day.

Experiment II.—Similar to experiment I, except that the medulla in glycerine was kept in the incubator at a temperature of 98° F. for two days. A rabbit inoculated subdurally with a portion of this incubated medulla showed the first symptoms of rabies on the tenth day, and died on the twelfth day.

Experiment III.—Similar to experiments I and II, except that the medulla in glycerine was kept at 98° F. for three days. A rabbit inoculated subdurally with a portion of this incubated medulla showed symptoms of rabies after twenty-six days, and died in thirty-three days.

From these experiments, it will be seen that rabies virus in glycerine is very sensitive to a temperature bordering on blood heat. When this is the case the bottle of glycerine containing the virus should be packed in ice, otherwise there is a danger of the virus being destroyed, and the possibility of a wrong interpretation being put on the result of the experiment. Experiment I demonstrates that three days in glycerine at a temperature of 99° F. reduces the virulence from a seven days' incubation period to thirty-eight days. Packing in ice is only necessary for one or two months in the year, in most parts of India. During the greater part of the year samples of brain and spinal cord sent to the Institute in glycerine arrived in a virulent condition, and the experiments made for test purposes were reliable.

To the majority of medical men it is no doubt superfluous to give minute directions as to how to send a portion of brain or spinal cord for test purposes. On the other hand, these directions are certainly required by some and also by the majority of people who get bitten by rabid animals. During the past year I have received samples sent in spirit, some in water, and one or two in varnish. All these arrived in a condition quite useless for experimental purposes. A few have also sent the animal's head packed in sawdust, and these on arrival were found to be in an advanced state of putrefaction.

VII.—Work done during the Year in addition to Anti-rabic Treatment.

A considerable amount of general bacteriological work was carried out during the year in addition to anti-rabic treatment. This consisted for the most part in the diagnosis of diseases and the preparation of anti-typhoid vaccine.

1. Serum diagnosis was carried out in 134 cases, viz.—

(*a*) 84 cases for typhoid fever, with a positive result in 47, and a negative result in 37 ;

(*b*) 50 cases for Malta fever, with a positive result in 23, and a negative result in 37.

2. Twenty-five samples of sputum were examined for tubercle bacilli, with a positive result in 16, and a negative result in 9.

3. In material sent from 2 cases of suspected cholera, the cholera bacillus was isolated in both cases. A bacteriological examination of 3 samples of aerated waters suspected of conveying cholera gave negative results in all three.

A sample of butter bacteriologically examined for typhoid bacilli also gave negative results.

4. Forty-six samples of blood were examined for malarial parasites, with a positive result in 38, and a negative result in 8.

5. Fifty-five samples of water were chemically analyzed, and 2 samples bacteriologically.

6. Ten samples of blood and cerebro-spinal fluid from cerebro-spinal fever cases were examined for the *Diplococcus intracellularis* of Weichselbaum, with a positive result in 8, and a negative in 2. Five of these samples were blood, and diplococci were present in 3.

7. Twenty-one examinations of pathogenic material, such as pus, tumours, &c., were made, and a diagnosis given in all.

8. Anti-typhoid vaccine was prepared and sent out for about 1,150 or 1,200 cases.

9. Instructions in general bacteriological work were given to 10 medical officers.

10. The staff of the Institute assisting me were also taught their duties, as none of them had had any previous experience in laboratory work.

In addition to myself, the staff consists of Assistant Surgeon C. J. Fox, I.S.M.D., Hospital Assistant Nanak Chand, and two laboratory assistants.

VIII.—The Institute.

The building at present used as an Institute had previously been a private residence. It is a large one-storied house, containing eleven rooms, with extensive grounds and out-houses.

The rooms are allotted as follows:—Library and office; waiting-room; inoculating room; a room for microscopic work; a dark room for drying spinal cords; an experimental room; a room where inoculated animals are kept for observation; a surgery, where bites are dressed; an incubating room, where bacteria are cultivated, &c.; a room for the preparation of media, sterilization, &c.; a store-room.

The building had in the first place to be thoroughly overhauled and prepared for its present use. Most of the apparatus, instruments, &c., were obtained from London and Paris. The Central Committee also contributed a considerable number of articles purchased from Lieutenant-Colonel Roe, I.M.S., who disposed of them before leaving India. New apparatus is of course being added on from time to time as required. The Institute is at present well equipped for general bacteriological work in addition to anti-rabic treatment, and with a very moderate expenditure the preparation of anti-venene and other anti-toxins could be undertaken at once. I may also add that authority to start the Institute was received on the 13th March, 1900, and that patients were received for treatment on the 9th August, under five months from the date of sanction.

IX.—Concluding Remarks.

When we take into consideration the circumstances under which the Institute was started, and the very limited funds at its disposal during the first year, it was hardly to be expected that much could be attempted outside anti-rabic treatment. With a very moderate outlay, there are, however, several directions in which the work and value of the Institute could be greatly increased.

1. At present what is wanted most are facilities for the preparation of anti-venomous serum and other anti-toxins, such as anti-diphtheritic serum and anti-tetanic serum. Judging from the applications which I constantly receive asking for anti-toxins, the above three are most required in India.

Many people in India evidently believe that these anti-toxins are prepared at Kasauli, otherwise why should they telegraph asking for a supply? To these applications I have invariably been obliged to reply: "Have not yet undertaken the preparation of anti-toxins." Stables and horses are required before anything can be done in this direction. Stabling for, say, ten horses would probably be sufficient to make a good beginning. Young horses with blemishes, which in no way interfered with their general health, could be obtained from any of the remount depôts or from other sources. After supplying anti-toxins for two or three years (probably longer) they could then be sold, and some of them would no doubt realize cost price or perhaps more.

Anti-toxins should certainly be prepared in India, instead of having to be purchased in Europe at exorbitant prices, and kept stored in this country, where they soon deteriorate in the heat of the plains. Besides, it is little short of a standing reproach to India that a remedy for snake-bite should have to be obtained from another country where snakes are few and practically harmless, when at comparatively little expense the remedy could be prepared on the spot.

2. A considerable amount of teaching in general bacteriological work could also be undertaken. I feel sure that there are many medical officers of the R.A.M.C. and I.M.S. in India, also native medical men, who would only be too pleased to have an opportunity of going through a short course of bacteriology and making themselves practically acquainted with the latest methods of diagnosing diseases. A nucleus for the dissemination of knowledge of this kind, which bears practically on the most important points connected with a large number of Indian diseases, could be established in Kasauli at a small expense to Government. No doubt some medical officers would like to work at subjects in which they are interested and do original research.

As examples of fields for work I may mention some of the important diseases of India, such as typhoid fever, plague, cholera, dysentery, beri-beri, and cerebro-spinal fever in man, also surra in horses. Facilities to investigate such diseases would cost little in proportion to the benefits to be derived. My experience is that there are many medical officers in India who would only require a little help in order to be in a position to investigate the origin, spread and prevention of tropical diseases, and to carry out useful clinical bacteriological work. A certain amount of practical acquaintance with the methods of research is absolutely necessary before any medical man can possibly be in a position to take up the investigation of epidemic diseases. A beginning in this direction is urgently wanted in India. In no country in the world is the necessity for such work more in evidence.

In conclusion, I wish to record the very able manner in which I have been assisted in the work of the Institute by Assistant Surgeon C. J. Fox, I.S.M.D. Mr. Fox has worked hard all day and every day during the past year, and has taken an intelligent interest in mastering the details of his duty. His services have been at all times freely given for extra work when required. Hospital Assistant Nanak Chand has also rendered valuable assistance, and has been both zealous and careful in the performance of his duties.

I.—Persons who contracted Hydrophobia during Treatment.

(*Late cases.*)

1. Nanbi Bohn (woman), age 29 years, from Lalitpur, Central India. Bitten on the 29th December, 1900, by a wolf, which also bit a number of other people. Four deep bites on the face, viz., one on front of right ear, one on right cheek, one on the upper lip, and one on the right side of the lower jaw. None of the wounds had been cauterized. All the wounds were suppurating on arrival at Kasauli on January 17th, 1901 Treatment at the Pasteur Institute was commenced on January 17th. Symptoms of hydrophobia set in on January 20th, and she died next day. Two other persons bitten by the same wolf, and who were treated at the same time, remain well.

2. Kamalia (a girl), age 11 years, from Lalitpur, Central India. Bitten on 29th December, 1900, by a wolf, which also bit a number of other people. Five deep bites on the face, viz., one on the left eyebrow, three on the right side of the lower jaw, and one long lacerated wound on the left side of the lower jaw. None of the wounds had been cauterized; all were suppurating on arrival at Kasauli on January 17th, 1901. Treatment at the Pasteur Institute was commenced on January 17th. Symptoms of hydrophobia set in on January 20th, and she died next day. Two other people bitten by the same wolf, and treated at the same time, remain well.

3. Hirya (woman), age 22 years, from Lalitpur, Central India. Bitten on the 29th December, 1900, by a wolf, which also bit a number of other people. Four deep bites on the face, viz., two on left side of lower jaw below the ear and two on the chin. Two deep bites on the front of the neck and one on the left thumb. Seven bites in all. None of the wounds had been cauterized, and all were suppurating when patient arrived on January 17th, 1901. Treatment at the Pasteur Institute was commenced on January 17th. Symptoms of hydrophobia set in on January 30th, and she died on February 3rd, 1901. Two other people bitten by the same wolf, and treated at the same time, remain well.

4. Ladli (woman), age 45 years, from Lalitpur, Central India. Bitten on the 29th December, 1900, by a wolf, which also bit a number of other people. One deep lacerated wound on the left side of the neck, and one deep bite on the left heel. None of the wounds had been cauterized, and all were suppurating when the patient arrived for treatment on January 17th, 1901. Treatment at the Pasteur Institute was commenced on January 17th. Symptoms of hydrophobia set in on February 4th, 1901, and she died on the 6th. Two other people bitten by the same wolf, and treated at the same time, remain well. A rabbit inoculated subdurally with a portion of the brain of this case on February 6th showed commencing paralysis on February 20th (fourteen days' incubation), and died on February 23rd from typical rabies. A second rabbit inoculated from the first one showed commencing paralysis after thirteen and a half days, and died on the sixteenth day from typical rabies. In the ordinary course of events the period of treatment for the above four cases should have been twenty-one or twenty-two days at least.

II.—Persons who contracted Hydrophobia within Fifteen Days from the Date of the last Inoculation (not counted as Failures for Reasons given in Report.)

1. No. 4197 Private P. F., 2nd Battalion, South Lancashire Regiment, Saugor, Central Provinces, age 27 years. Bitten by a dog on 11th October, 1900. Twenty-five bites altogether, viz., eighteen bites on the face. Some of those at the base of the nose and close to the eyes were very deep. One on the right hand, and six on the left hand. The dog held on to the patient's face and nose until he choked him off, and in doing so he got bitten on the hands. The wounds were cauterized twenty-four hours afterwards by nitric acid. The wounds at the base of the nose and some on the face and hands were suppurating when the patient arrived for treatment on October 16th. Treated at the Pasteur Institute from October 16th to November 6th. During the first week of treatment he suffered from ague, and tertian parasites were demonstrated in his blood. Symptoms of hydrophobia set in on November 20th, and he died on the 21th. Another patient bitten on the face by the same dog, but not so severely, underwent treatment at the same time, and remains well.

2. Ram Tyari (a girl), age 9 years, from Rampur, near Aligarh. Bitten by a dog on 9th December, 1900, which showed unmistakable symptoms of rabies and bit three other people. Eight bites altogether, viz., one on forehead, one on right eyebrow, four on right shoulder, two on the right side of the chest. All deep bites and inflicted through the exposed skin. The wounds were cauterized about two hours afterwards by chemicals. All the wounds were suppurating when the patient arrived for treatment on December 16th, 1900. Treated at the Pasteur Institute from December 16th to

January 6th. Symptoms of hydrophobia set in on January 15th, and she died on January 16th, 1901.

3. Kailash Nath (a man), Patwari, age 40 years, from Gonda. Bitten by a jackal on February 27th, 1901, which bit several other people. Thirty-six bites altogether, viz., one deep lacerated bite on the lower lip which split it open, one severe bite on the throat, sixteen punctures on the left knee, thirteen punctures on the right hand, and three on the left hand. None of the wounds were cauterized, and nearly all were suppurating when the patient arrived for treatment on March 2nd. The wound on the lower lip was gaping open. Treated at the Pasteur Institute from March 2nd to 27th. Symptoms of hydrophobia set in on April 3rd, and he died on the 5th.

III.—Persons Treated and who showed the First Symptoms of Hydrophobia more than Fifteen Days after the Completion of Treatment. (Failures.)

1. Buseeran (a girl), age 4 years, from Aligarh. Bitten on the 30th September, 1900, by a pariah dog, which was furious, foaming at the mouth, and bit two other dogs. Two deep bites on front of right ear, and one deep and lacerated bite on the right side of the chest. No clothes torn by the bites. Wounds cauterized two hours afterwards by nitric acid. All were suppurating when patient arrived for treatment on October 3rd. Treated at the Pasteur Institute from October 3rd to October 27th. Symptoms of hydrophobia set in on November 29th, and she died on December 2nd.

2. Chilapan (a coolie), age 19 years, from Paulghât, Malabar. Bitten on the 27th March, 1901, by a dog, which showed unmistakable symptoms of rabies and bit another person on the face. Eight deep bites on the left hand, one of which was a deep puncture on the palmar surface. Wounds cauterized about one hour afterwards by nitrate of silver. Treated at the Pasteur Institute from April 2nd to the 22nd. Symptoms of hydrophobia set in on May 14th, and he died on May 16th. A rabbit inoculated subdurally with a portion of the brain of this case showed commencing paralysis on the fourteenth day and died from typical rabies on the sixteenth day. Another patient badly bitten on the face by the same dog, and who underwent the intensive method of treatment at the same time, remains well.

3. Asai (a doolie bearer), age 25 years, from Ranikhet. Bitten on the 12th March, 1901, by a dog which showed symptoms of rabies, and which bit three other people and a dog. Two deep penetrating bites on the palm of the left hand. Wounds cauterized four hours afterwards by carbolic acid. Treated at the Pasteur Institute from March 25th to April 13th. Symptoms of hydrophobia set in on June 13th, and he died on the 15th. Three other patients (all Europeans) bitten by the same dog and treated at the same time; all remain well.

TYPE OF THE MEDIUM COURSE OF TREATMENT.

PASTEUR INSTITUTE OF INDIA, KASAULI.

Record of Prophylactic Treatment for Rabies.

No. 135, *dated* 18*th January*, 1901.

QUESTIONS.	ANSWERS.
General information.	
1. Name and Christian name	J.B.
2. Age and profession	29 years, Private, 4th Dragoon Guards.
3. Address	Cavalry Barracks, Rawal Pindi.
4. Date when bitten and by what animal	January 13th, 1901, by a dog.
5. Number of bites and upon what part of the body.	Four deep bites on the dorsal aspect of left hand.
6. Were the clothes torn by the bite?	No.
7. When was the wound cauterized, and how—by red hot iron or by chemicals?	About one hour afterwards by chemicals.
8. Condition of invalid and wounds on arrival.	Health good, wounds healing.
9. Veterinary statement of case.	"Certified that I have examined a fox-terrier bitch belonging to Lance-Corporal V., 4th Dragoon Guards, and find that she is suffering from rabies (in the furious form)."
10. Name and address of veterinary surgeon.	"J. B. S., Veterinary-Major, A.V.D., Rawal Pindi."
11. Certificate whether the dog or animal was examined before its death and after its death.	Examined before and after death.
12. Further information likely to be found useful.	The dog rushed at the patient and bit him on the hand without any provocation.
Special information.	
13. To whom did the dog or animal belong.	Lance-Corporal V., 4th Dragoon Guards.
14. What has become of it?	Destroyed.
15. Had it been bitten by some other dog or animal, and if so, what period elapsed before the disease appeared?	Not known. Another dog belonging to a man in the same troop suffered from rabies about a month previously.
16. Was there any change in its "bark"? Was there any change in its temper?	Yes. Yes.
17. Had the same dog or animal bite any other person or any other animal.	Yes; a native and three other dogs.
Laboratory information.	
18. Was the animal or its brain brought?	A portion of the brain sent in glycerine.
19. Animal inoculated	Rabbit on January 21st, 1901.
20. Result of inoculation	*February 3rd.*—Commencing paralysis 13th day. *February 5th.*—Died to-day from typical rabies.

Class A, Sub-Class II.

TREATMENT.

No. of Inoculation.	Date.	Age of Cord.	Observations.
		Days.	
1	January 18th ..	14	
2	,, 19th ..	13—12	
3	,, 20th ..	11—10	
4	,, 21st ..	9—8	
5	,, 22nd ..	7	
6	,, 23rd ..	6	
7	,, 24th ..	5	
8	,, 25th ..	5	
9	,, 26th ..	4	
10	,, 27th ..	3	
11	,, 28th ..	7—6	
12	,, 29th ..	5	
13	,, 30th ..	4	
14	,, 31st ..	3	
15	February 1st ..	6—5	
16	,, 2nd ..	4	
17	,, 3rd ..	3	
18	,, 4th ..	6—5	
Severe bites, or bites about the head and face. 19	,, 5th ..	4	
Severe bites, or bites about the head and face. 20	,, 6th ..	3	Treatment completed.
Severe bites, or bites about the head and face. 21			

RESULT.—May 10th received a post-card notifying that patient was quite well.

D. SEMPLE, M.D., Major, R.A.M.C.,
Director

APPENDIX No. VI.

(I) A REPORT ON THE CONTINUOUS TREATMENT OF SYPHILIS IN THE BRITISH FORCE IN EGYPT 1900.

(II) FURTHER REPORT ON THE TREATMENT OF CONSTITUTIONAL SYPHILIS AMONGST THE TROOPS IN THE EGYPTIAN COMMAND FROM 1st JANUARY TO 31st OCTOBER, 1901.

By Colonel W. J. Fawcett, M.B., Royal Army Medical Corps, Principal Medical Officer, British Force, Egypt.

I.

The satisfactory results following the course adopted in the Egyptian command for the systematic treatment of syphilis during the past year and in the last four months of 1899 justify the detailed description of the arrangements made by me.

The importance of continuous treatment in dealing with constitutional syphilis has been very prominently brought forward, both by Mr. J. Hutchinson and also in the interesting discussion at the General Meeting of the British Medical Association, 1899, where the remarks of Majors Dick and Lambkin, R.A.M. Corps, and the paper of Mr. A. H. Ward, Surgeon to the London Lock Hospital, amongst many others of great value, laid down the principles on which the rational treatment of syphilis should be conducted.

In the autumn of 1899 the General Officer commanding the British force in Egypt, Major-General the Honourable R. A. J. Talbot, C.B., who even then fully appreciated the special value of this treatment in military life, asked me to apply to the whole of Egypt the arrangements which I had practised in the Poona Garrison during 1898 and 1899 with considerable success.

A few figures are submitted showing the extent of primary and secondary syphilis amongst the troops in the command for the past five years.

British Troops in Egyptian Command.

Primary Syphilis—Admissions and Invaliding, 1896 to 1900.

Year.	Disease.	Admissions.	Ratio per 1,000	Average constantly sick.	Ratio per 1,000	Invalided.	Ratio per 1,000.
1896	Primary Syphilis	312	79·7	27·40	7·00	Nil	Nil
1897		124	27·9	14·73	3·31	Nil	Nil
1898		229	46·6	22·46	4·57	3	·61
1899		140	35·4	16·23	4·10	Nil	Nil
1900		32	8·5	3·25	·86	Nil	Nil

Egyptian Command.

Secondary Syphilis—Admissions and Invaliding, 1896 to 1900.

Year.	Disease.	Admissions.	Ratio per 1,000.	Average constantly sick.	Ratio per 1,000.	Invalided.	Ratio per 1,000.
1896	Secondary Syphilis.	208	53·1	22·19	5·66	Nil	Nil
1897		230	51·7	28·74	6·43	8	1·79
1898		221	45·0	21·53	4·38	10	2·03
1899		122	30·89	11·78	2·27	9	2·22
1900		48	12·7	4·33	1·15	1	·27

Egyptian Command.

Secondary Syphilis—Mortality from 1896 to 1900.

Year.	Disease.	Deaths.	Ratio per 1,000.
1896	Secondary Syphilis	Nil	Nil
1897		1	·22
1898		Nil	Nil
1899		1	·25
1900		Nil.	Nil.

The foregoing tables show a serious loss to the force, both under the head of "Constantly sick" and under that of "Invaliding," as well as two deaths during the four years 1896 to 1899, but in 1900 the admissions for primary syphilis were only 32 compared to 201, the average annual admission ratio for the four preceding years, and the admissions for secondary syphilis were only 48 in 1900 compared to 195, the average annual admission rate of the four preceding years.

During the years 1896 to 1899, 30 men were invalided for syphilis, or an annual average of 7·5 per annum, while in 1900 one man was invalided and this case was one of very long standing constitutional syphilis in a man whose health had broken down from other causes.

The extraordinary diminution in the number of admissions for primary syphilis cannot fail to attract attention, and this diminution can probably be accounted for, in a great measure, by consideration of the three factors given below.

(*a*) Granting for the moment that the ravages of secondary syphilis in the force were very much modified, probably almost removed, it follows that during the year 1900 there were but very few diseased men in the garrison capable of infecting those prostitutes with whom their comrades habitually consort.

(*b*) The greatest possible accuracy in the differential diagnosis of venereal sores was arrived at by all the surgeons; no cases were shown as primary syphilis unless they were undoubted infected sores; and as a consequence the number of admissions for primary syphilis was reduced to a minimum.

(*c*) In March 1900 the 3rd battalion Seaforth Highlanders arrived to garrison the Citadel, Cairo. This militia battalion, composed largely of young men from the Western Islands of Scotland, is remarkable for its exceptionally good conduct; and there were only three admissions for primary syphilis from this battalion with an average annual strength of 602 men, against 32 admissions in the remainder

of the force in Egypt, giving a ratio per 1,000 for the 3rd battalion Seaforth Highlanders of 4·98 and for the rest of the garrison of 10·11 per 1,000.

It is now proposed to consider by what means this enormous reduction in admissions, invaliding, and deaths was brought about.

In October 1894, the following rules were published for the information and guidance of all medical officers in the command, the main object being to obtain a uniform and continuous treatment of constitutional syphilis, and as far as possible to make certain that no case could escape regular medical supervision and a sustained treatment.

No originality is claimed for these rules, the heading of the record of syphilis being but a modification of one previously in use in the R.A.M.C. hospitals.

Memorandum on the Treatment of Syphilis.

In order to cure cases of syphilis it is essential that they remain under medical observation and, generally speaking, under continuous medical treatment, for a minimum period of eighteen months.

To attain this end the following modifications of existing arrangements will at once come into force:—

No. 1.

At each station hospital and inspection room in the command a book, to be called the "Record of Syphilis," is to be kept up; a copy of the headings is subjoined.

Note.—The books now in use can be modified to the new form.

No. 2.

By means of the intra-muscular injection of mercury a sufferer from this disease can, while doing his duty, receive effectual treatment. It will therefore be adopted generally, and carried out for the period of eighteen months.

A full and instructive account of the treatment by Surgeon-Major Love, A.M.S., is given in the Army Medical Report for the year 1894, Appendix III.

No. 3.

When a man under treatment is transferred to another charge, the officer who had the care of the case will send a memorandum giving the necessary professional information to the man's new medical attendant, making an entry that he has done so in the last column of the Syphilis Register.

No. 4.

In the case of a man objecting to treatment after a full and careful explanation of the principle has been given him, the officer in charge of the man will refer the matter to the officer in charge of the Station Hospital.

Except on medical grounds no man is to escape continuous treatment.

No. 5.

Every man on the Register will be seen once a fortnight so long as active symptoms are present. At no time will a longer interval than a month elapse without an examination of the patient. No case will be discharged as cured until it has been eighteen months under continuous observation and treatment.*

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* Great care will be exercised in the diagnosis of true infecting sores; and on the discharge from hospital of every case of primary syphilis, should the patient not have already developed signs of constitutional infection his name will be sent to his Regimental Medical Officer, who will place him on the list for periodical inspection. If at the end of three months from discharge from hospital he has not developed either skin or throat symptoms, his name may be erased from the register.

No. of Case.	Date on which continuous treatment commenced.	Corps.	Regimental Number.	Rank and Name.	Prescription used.	No. and Date of Injections.	Treatment in Hospital.	No. and Date of Injections.	Treatment out of Hospital.	Brief remarks noting extent and nature of original syphilitic manifestations and the effect of treatment upon them. If transferred, to what station, with the address and date of the Memo. sent concerning the case. An entry to be made in the Med. History Sheet showing the date on which continuous treatment commenced.

No. 6.

A copy of the foregoing will be made and pasted in the beginning of the Syphilis Register.

Notes on Special Points.

No. 1.

The use of perchloride of mercury as a hypodermic injection is objectionable for many reasons, but principally because it is absorbed and excreted too rapidly.

No. 2.

The most useful prescription is given in the A.M. Dept. Report for 1894. The ingredients require to be rubbed together for at least four hours, and even then, in hot weather, the mercury may fall to the bottom; attention to the condition of the mixture is therefore necessary to prevent disastrous consequences.

No. 3.

The needles of the syringe will not bear repeated heating in a lamp flame, but are most readily and quickly sterilized in a porcelain dish containing sweet oil heated to the temperature at which a crumb of bread floating in the oil begins to brown.

No. 4.

The needles must be plunged in deeply; an injection into the subcutaneous areolar tissue is always painful; it is inadvisable to inject near the site of a recent injection.

No. 5.

The patient should be exhorted to use a tooth-brush regularly while under treatment. The evidences of slight constitutional mercurial effects, such as a little sponginess of the gums, especially if maintained for some considerable time, is favourable to cure, and a condition to be desired.

No. 6.

It is to be clearly understood that the foregoing are but statements of sound general principles, and are not to hamper the exercise of the medical attendant's free judgment in each and every case.

It may be well to state here that the prescription now universally used is

℞ Hydrarg. ʒi.
Lanoline ʒii.
Olive oil ʒii.

Sterilize the olive oil by boiling, then rub the ingredients well together for at least four hours; dose, five to ten minims.*

It is important to notice that by the foregoing rules no man once entered on the Syphilis Register could, while the rules were obeyed, escape continuous treatment, no matter how often he moves from place to place.

The rules were well received by all medical officers and most loyally carried out, for without their cordial co-operation the results given above could never have been attained.

The number of men under observation and treatment during the year was 107, and they have had an average of 20 injections per man.

At first a few men declined to submit to the treatment, but all unwillingness on their part has now passed away, and in one corps alone five men who had contracted constitutional syphilis without applying for treatment for the original sore voluntarily presented themselves for intra-muscular injections.

Practically no unfavourable effects followed the treatment: in a few instances a lump could be felt at the side of the injection for a week or ten days, but this lump was nearly painless, and if the injection is done about the upper portion of the gluteus maximus it is not pressed on or rubbed, and the patient continues to do his duty without inconvenience.

At first some men presented signs of rather severe mercurial stomatitis. In these cases probably the surgeon had lost sight for the moment of the golden rule that the long-continued use of mercury in small doses is of paramount importance, while any attempt to press the drug is much to be deprecated.

In Lower Egypt the climate is favourable to the out-door treatment of syphilis, and even more important is the absence of malaria, with its consequent debility, which so often gives rise to a condition of ill-health that renders any attempt at the curative treatment of syphilis futile.

Early in 1901, a careful inspection of the British force in Egypt, some 4,000 men, showed that there were only two men unfit for active service on account of secondary syphilis, a condition of things which may be considered unprecedented in the British Army.

It is still more remarkable that further examination of one of these cases showed that the man, while suffering from old standing secondary syphilis, had been struck off the roll of those attending hospital after only six months' treatment, contrary to the orders on the subject: he returned to hospital three months later the worst case of secondary syphilis in the garrison.

The two points which make this treatment of the greatest value in military life are that the patient can do his duty all the time he is under treatment, and, even more important still, he cannot fail to receive medicine regularly, as one injection at intervals of from one to five weeks is all that is required.

While both the truth of the principles on which the treatment sketched in the foregoing, and the facility with which it can be adopted in military life are equally undoubted, yet on account of the constant changes of stations and commands to which both soldiers and their medical advisers are exposed it is essentially necessary that the arrangements should receive the close attention of the medical administrative officers to ensure the success of this treatment of syphilis, of which the special efficacy in military life is beyond all doubt.

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* In consequence of a series of cases of mercurial ptyalism of a grave character having arisen in the year 1901, the maximum dose should be 5 minims; to be administered not more frequently than once a fortnight for not more than three consecutive periods of fourteen days. An interval of four weeks will then follow during which no mercury is to be given. The treatment may then be resumed.

II.

Further Report on the Treatment of Constitutional Syphilis amongst the Troops in the Egyptian Command by the Intramuscular Injection of Mercury and Continuous Observation from the 1st January to 31st October, 1901.

Between April and July, 1901, a series of cases of mercurial poisoning has arisen amongst the soldiers undergoing treatment for constitutional syphilis by the intramuscular injections of mercury; and of so grave a character were the symptoms of these cases that it is essential to deal fully with them, and very carefully to review the opinions expressed in the report for 1900.

It will therefore be best first to give a concise history of the worst cases as well as notes of some less grave but typical instances, and afterwards to relate the effects of this treatment on the whole body of troops in Egypt.

The cases arrange themselves under three headings:—

1st. One, or possibly two, fatal cases of mercurial poisoning.

2nd. Three men who suffered so gravely as to require change to England.

3rd. Seven patients who have unfortunately shown symptoms of excessive mercurial ptyalism, but have now recovered completely.

An appendix is given which shows in a tabular form all particulars concerning the whole of the cases, except a few of no real importance.

Case of Private G.

Age.	Service.	Disease.
25	7	Secondary syphilis.

He came under continuous treatment on September 11th, 1900, at the Station Hospital, Cairo, and was discharged from hospital on September 22nd, 1900, having had one injection. When discharged he had a secondary rash on his chest.

He subsequently received, up till February 1901, eleven injections, and afterwards had injections on February 13th, 27th, March 6th, 13th, 27th and April 3rd, making eighteen in all. On April 18th he complained of soreness of the gums, and on examination he was found to have rather severe stomatitis. The fauces were ulcerated, the ulcerations being deep with a velvety grey slough at the bottom. The process, was, however, localized, and but little sponginess of the gums was present, while fœtor of the breath was not marked.

On April 24th the ulceration had extended to the soft palate on the right side and there was sponginess of the mucous membrane reflected between the maxillæ on the right side, the third molar tooth on that side being almost enveloped. Even at this time there was no more salivation and fœtor of the breath than would occur in a simple stomatitis.

He was again admitted to hospital on April 24th, where the condition slowly improved; towards the end of May he commenced to take solid food, the ulceration having receded, and he appeared to be nearing convalescence, when on June 1st he took a sudden turn for the worse and anorexia and debility suddenly reappeared. He died rather unexpectedly in the early morning of June 2nd.

Post-mortem:—A large, white, firm ante-mortem clot was found in the left chambers of the heart; the large intestine was congested, the small one being normal. The tongue was swollen, and there was ulceration of the buccal mucous membrane, the teeth being decayed but firm. The local condition of the mouth was markedly better than in April on his second admission. Private G. thus had a total of eighteen injections from September

No. of Case.	Date on which continuous treatment commenced.	Corps.	Regimental Number.	Rank and Name.	Prescription used.	No. and Date of Injections.	Treatment in Hospital.	No. and Date of Injections.	Treatment out of Hospital.	Brief remarks noting extent and nature of original syphilitic manifestations and the effect of treatment upon them. If transferred, to what station, with the address and date of the Memo. sent concerning the case. An entry to be made in the Med. History Sheet showing the date on which continuous treatment commenced.

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11th, 1900, to April 18th, 1901, a period of thirty weeks, or an average of ·6 injection per week. The maximum dose given was ten minims; he had therefore thirty-six grains of mercury in thirty weeks, or slightly over one grain a week.

Case of Private R.

Age.	Service.	Disease.
31	9	Secondary syphilis.

Between 1894 and 1898 he had many admissions for secondary syphilis, and in October and in November, 1899, was thirty-two days in hospital with that disease.

On December 18th, 1900, he was again admitted to hospital, and from December 29th, to March 16th, 1901, he had twelve intramuscular injections. He was discharged on March 18th, and subsequently had four intramuscular injections on April 3rd, 10th, 24th, and May 1st. Symptoms of ptyalism appeared on May 8th; at that date the symptoms of syphilis were predominant, amongst which a perforation of the palate and a scaly syphilide of the lower extremities were marked.

He was admitted to hospital on the 8th May, injections of course being discontinued. He had since December 29th had sixteen injections, being an average of one per week. The maximum dose administered was ten minims, containing two grains of mercury.

Subsequent to his admission to hospital he improved, and on 20.6.1901 was transferred to Alexandria Hospital for change of air. He was discharged as convalescent to Mustapha Barracks, but on 6.7.1901 was readmitted to hospital with severe stomatitis. He alternately improved and retrograded, a brief period of improvement being quickly followed by a severe relapse, as if, as was doubtless the case, some fresh focus of mercury were being absorbed. The emaciation, notwithstanding a large ingestion of food, was progressive, and from his normal eleven stone he fell finally to seven stone. He died of exhaustion on 17.8.1901.

Post-mortem :—There was extreme emaciation, together with ulceration of the buccal mucous membrane and periostitis of the lower jaw. The mucosa of the sides of the tongue was deeply ulcerated, part of it, however, showing granulations. There was also deep ulceration of the lateral glosso-epiglottidean folds, and the epiglottis itself was much involved.

The tissues were searched chemically and microscopically for traces of mercury, but none were found.

Case of Private S.

Age.	Service.	Disease.
25	2	Secondary syphilis.

Private S. commenced continuous treatment in April, 1900. He left hospital June 6th, 1900, and up till February, 1901 had had seventeen injections: after the 7th February he had two only, viz., on March 13th and 27th. On May 1st he showed marked tenderness of the gums and slight ulceration of the buccal mucous membrane on the right side.

The alimentary tract was evidently extensively involved, for the tongue was furred and digestion bad, while traces of blood were noticeable in the stools.

He was admitted to hospital on May 3rd, the ulceration having progressed, and the condition of the bowels reminding one of dysentery. In this case, again, the salivation was not out of proportion to the local lesion.

In hospital Private S. improved and was discharged to duty. Shortly afterwards an exacerbation of stomatitis occurred, and he was readmitted to hospital. He was subsequently transferred for change of air to Alexandria on 4.7.1901, and after a protracted illness improved, and was invalided to England on 14.11.1901.

Case of Private McL.

Age.	Service.	Disease.
24	5	Secondary syphilis.

Private McL was subjected to continuous treatment by intramuscular injections on 19.1.01. He had in hospital four injections and was discharged on March 2nd. Between this date and April 24th he had five more injections, viz., on March 2nd, 13th, and 20th, and April 3rd and 10th. He was admitted to hospital on April 24th with intense salivation and marked fœtor of the breath, while there was but slight ulceration. The salivation and fœtor of the breath were more severe in this case than in any of the other cases in their early stage. In hospital McL improved, though but slowly, and after a change of air at Alexandria returned to duty quite recovered, and in an excellent state of health. He had a total of nine injections, being an average of ·8 per week, or about 1½ grains of mercury per week, and altogether 18 grains of mercury.

The occurrence of these twelve cases was as alarming as unexpected. In the very wide experience of this treatment gained by the management of hundreds of cases of men, many of whom had far more mercury than had been administered to any of these men, nothing similar had ever been met with.

In the very careful inquiry which followed, consideration was given to many matters, but the chief points of interest elicited are noted below :—

The cases all occurred in Cairo, not one at Alexandria, though at both stations the intramuscular injection of mercury for all cases of secondary syphilis was the universal practice.

The whole of the cases arose in the practice of four medical officers,* all extremely careful reliable men who have from one to two years' acquaintance with the details of this work.

The mercury used was free from adulteration ; and it was proved that the beer sold in barracks did not contain arsenic, though a very remarkable majority of the sufferers were heavy drinkers.

Several cases of stomatitis, some of more than moderate severity, occurred either as a sequela of influenza, or without apparent cause, during the hot weather amongst the troops in all barracks in Cairo, though in none of these had mercury in any form been given.

That some of the men under treatment by injection for constitutional syphilis at the same time obtained medicines from the pharmacies in the town is undoubtedly a fact, but this can be considered to account for but a small proportion of these cases of mercurial poisoning. Individual idiosyncrasy and a peculiar susceptibility to the effects of mercury was also present in a small number of these men, and doubtless caused aggravation of their symptoms.

The form of injection used was that recommended in the report for 1900. It was thought probable that the metallic mercury had in some instances

* The term medical officer throughout this report includes civil practitioners in regular military employ.

not been completely mixed with the fats, but further experiments showed that when the mercury is still in the globular form it is not easy to send it through the syringe.

One case, that of Private R., given above, had twelve injections between 29th December, 1900, and 16th March, 1901, of 10 minims each, and between 3rd April, 1901, and 1st May, 1901, four injections of 10 minims each; that is, roughly speaking, about 20 or 30 grains of metallic mercury spread over four months. This is not a large quantity of the drug, yet its administration was followed by a most serious train of symptoms, the most remarkable of which were periodical exacerbations of the poisoning, followed closely by more than one interval of marked improvement, and as this train of symptoms was also present in the case of Private S. and to a less extent in some others, it must be considered proved that in some of the patients improvement in general health is followed by absorption of mercury which has hitherto remained inert in the site of the injection. Unfortunately also this absorption from the tissues sometimes goes on for months; for example, Privates R. and McL. were still suffering from mercurial poisoning two or three months after the injections had ceased. Before leaving Private R.'s case it may be remarked that the number of injections given in the time was nearly the maximum possible; this therefore being the only instance in the series in which it might be argued mercury had been pushed too far.

The case of Private G. is worthy of special comment. In the seven months preceding death he had eighteen injections, or a total of considerably less than 36 grains of mercury; yet he was certainly salivated, though clinical observation of the case leads me to the belief that the ulceration of the tongue and mouth were syphilitic rather than mercurial, though undoubtedly aggravated by the drug. Therefore the death was recorded as due to syphilis, though the case is alluded to here, for obvious reasons.

The regrettable circumstances detailed above naturally attracted the attention of all concerned, and it was accepted that a large proportion of the cases were due to the injections alone, yet so great was the confidence felt by every medical officer in the command in this line of treatment, and so high an opinion had they formed of its efficacy, that not one of them wished to abandon it. If, however, the treatment was to be continued, it was essential to so modify it as to make it absolutely certain that no further cases of mercurialism could occur amongst those undergoing the treatment, and the directions shown in the footnotes to pages 472 and 475 were circulated for the information of all concerned. Whether this great reduction in the amount of mercury will diminish or destroy the efficacy of the treatment remains to be seen.

The tables which follow will, by a comparison with those on page 2 of last year's report, enable an opinion to be formed as to the efficacy of the work of the past year. In the column of deaths is entered the case shown in the statistical returns as mercurial poisoning.

British Troops in Egyptian Command.

Primary Syphilis. Admissions and Invaliding.

Year.	Admissions.	Ratio per 1,000.	Average number constantly sick.	Ratio per 1,000.	Invalided.	Ratio per 1,000.	Remarks.
1896	312	79·7	27·40	7·00	—	—	
1897	124	27·9	14·73	3·31	—	—	
1898	229	46·6	22·46	4·57	3	·61	
1899	140	35·4	16·23	4·10	—	—	
1900	32	8·5	3·25	·86	—	—	
*1901	19	4·73	1·80	·45	—	—	*To 31.10.01

Secondary Syphilis. Admissions and Invaliding.

Year.	Admissions.	Ratio per 1,000.	Average number constantly sick.	Ratio per 1,000.	Invalided.	Ratio per 1,000.	Remarks.
1896	208	53·1	22·19	5·66	—	—	
1897	230	51·7	28·74	6·46	8	1·79	
1898	221	45·0	21·53	4·38	10	2·03	
1899	122	30·8	11·78	2·27	9	2·27	
1900	48	12·7	4·33	1·15	1	·27	
*1901	76	19·0	7·27	1·81	4	·99	*To 31.10.01

Secondary Syphilis. Mortality.

Year.	Deaths.	Ratio per 1,000.	Remarks.
1896	—	—	
1897	1	·22	
1898	—	—	
1899	1	·25	
1900	—	—	
*1901	2	·50	*To 31.10.01.

Of the four cases invalided, all but one are due to the effects of mercury, and the remaining one that of a man who contracted syphilis at Khartoum; the original disease escaped early recognition, and his condition has gone on from bad to worse; intramuscular injection failed to improve the symptoms, and the case is the first in which, during two years' Egyptian experience, the continuous treatment has failed.

Early in November a very careful inspection of the whole force in Egypt enables me to say that amongst the 4,000 men, there is, excepting the invalids mentioned above, only one man unfit for active service owing to syphilis, and he arrived from England this year in an advanced condition of secondary syphilis in which nothing but palliative treatment is possible.

If the figures in the tables given above for the ten months of the current year be compared with those of the years prior to the commencement of this treatment in the autumn of 1899, it will be seen that a most remarkable diminution in the numbers in all the columns of the return has taken place, and I think the tables for the last two years show a ratio for admissions and invaliding unequalled in any command at any time. If, moreover, a little special pleading be permitted for a moment, and the cases due to this disastrous epidemic of mercurialism be erased, there will be a great reduction in the column for admissions for secondary syphilis; the invaliding will be one case, with a ratio per 1,000 of ·25, and the deaths will be *nil*, giving statistics which display a diminution of the manifestations of constitutional syphilis which leaves but little to be desired.

The decrease in the number of admissions for primary syphilis is due in a great measure to accuracy of diagnosis, no case being ever shown under that head, unless presenting every characteristic of the true infecting sore.

During 1900, 107 men underwent treatment, during the ten months of 1901 under consideration, 106 men have been treated, and at this date only 56 men remain on the register, a most satisfactory diminution in the number of the cases.

The following is a summary of facts and conclusions, which it is hoped may be considered justifiable:—

The dose of the mercurial injection in Appendix to A. M. D. Report for 1894 and repeated in my report of 1900 is dangerously large; attention had been directed to this fact by an authority some years ago, but prior to the occurrence of these cases very extensive use of the drug for years had warranted the medical officers of Egypt in believing the quantity used to be within the bounds of safety. For example, 107 men were treated in this Command in 1900 and received an average of twenty injections per man, without a single bad symptom arising; yet between April and July, 1901, a series of grave cases occurred in men who had individually received a smaller quantity of mercury.

A prescription containing mercury in a form suitable for intramuscular injection, in which the drug will be slowly but regularly absorbed, is much to be desired.

A system of continuous inspection of all men infected by syphilis, combined with a treatment by which but one dose of mercury is required at long intervals, is the key to the treatment of syphilis in the army; and this course is practicable, as has been proved in Egypt, where every one has co-operated to attain the end in view.

Cases of ptyalism occurring during intramuscular injections of mercury, 1901.

Rank and Name.		No. of injections.	Date of commencement of continuous treatment.	Date of last injection.	Date of onset of ptyalism.	No. of weeks under treatment.	What symptoms present during injections.	Result.
Private	G., J. ..	13	11.9.00	3.4.01	18.4.01	30	Secondary syphilitic ulceration of fauces.	Died 3.6.01.
,,	McL., J.	9	19.1.01	10.4.01	24.4.01	12	Secondary syphilitic sinuous ulceration of tonsils.	Recovered.
,,	S., F. ..	19	April, 1900	27.3.01	1.5.01	48	Secondary syphilitic ulcerations of buccal mucous membrane.	Invalided.
,,	R., W. ..	16	29.12.00	24.4.01	1.5.01	16	Syphilitic perforation of soft palate and extensive rash.	Died 17.8.01.
,,	C., W. ..	19	2.10.00	8.5.01	24.5.01	29	Severe stomatitis	Invalided.
Gunner	S., G. ..	26	25.11.00	25.5.01	13.6.01	28	Stomatitis	Recovered.
Private	T., H. ..	13	10.11.00	5.6.01	23.6.01	30	Severe stomatitis	,,
,,	B., Jas. ..	6	22.5.01	17.7.01	21.7.01	8	Profuse rash on lower extremities ..	Invalided.
,,	B., J. ..	22	17.6.00	29.5.01	3.4.01	46	Ulceration of fauces	Recovered.
,,	McP., W.	54	30.11.99	14.3.01	20.3.01	68	Considerable ulceration of gums with blue line. Great debility.	,,
,,	C., S. W.	11	14.1.01	3.7.01	19.7.01	40	Stomatitis with febrile symptoms ..	,,
,,	H., A. ..	4	4.5.01	10.7.01	20.8.01	10	Severe stomatitis	,,

APPENDIX No. VII.

REPORT ON MEDICAL TRANSACTIONS AND SANITARY REPORT, ETC., OF WEI-HAI-WEI FOR THE YEAR 1900.

By Major W. H. STARR, Royal Army Medical Corps.

Brief Résume of Events.—The early part of the year passed without any events of moment to disturb the tranquillity of Wei-hai-Wei. The Boxer movement in North China had been shown from time to time to be growing in strength and boldness, and various outrages had taken place, but apparently without producing any effect on the official mind. The boundary of the territory, known as Wei-hai-Wei, leased to Great Britain had as yet only been surveyed, and not definitely marked out.

Wei-hai-Wei Boundary Commission.—On 30th April, the Chinese Commissioner having arrived, the work was taken in hand. Lieut.-Colonel Bower, 1st Chinese Regiment, and Major Penrose, Royal Engineers, went out with an escort of the 1st Chinese Regiment to determine the points at which boundary pillars were to be erected.

Disturbances on the Boundary.—On May 5th a party of peasantry suddenly attacked Major Penrose's party near the village of Isao Miao Isz, and the Major was knocked down and wounded before a party from the closely adjacent camp came rushing to their rescue and dispersed the rabble without any loss on our side, several natives being killed and wounded. Captain Watson's camp a few miles off was threatened by a mob, who were easily dispersed by a few volleys without any casualty on our part.

Camps formed on the Boundary.—Reinforcements were sent out, and as a consequence of these disturbances a series of camps were formed along the boundary line and held by the Chinese Regiment, and they remained out in camp for some six weeks.

Disturbances in the North.—At the end of May came news of serious trouble in the north, and shortly after a force was landed from the fleet, and marines were sent up from here. On June 18th the last detachment of the Chinese Regiment out in camp returned to Ma'tou, and we heard of the taking of the Taku forts by the allied squadron. I took over medical charge of the marines left at Flagstaff Camp, some three miles away, as the naval surgeon was ordered away.

Hospitals improvised for Wounded from the Front.—Arrangements now had to be made on the island for the reception of a large number of wounded that were shortly expected. A large hall in Queen's House was rapidly got ready, and houses in the East Village were converted into a hospital, stores collected, &c. Everything possible was done, but at first, matters of necessity were somewhat rough and ready.

Wounded arrived.—On July 1st the first batch of wounded arrived from the front, twenty in number, all sailors and marines. The hospital on the island (Queen's House) was at first a joint Naval and Military hospital. A party of refugees also arrived. At this time there was only one Naval surgeon, myself, and a refugee missionary medical man, who was engaged by the Navy to do duty. Fortunately a civilian female nurse who was on leave from Shanghai was secured, and her services were invaluable, as trained staff was practically *nil*, and the services of marines had to be called on to perform the duties of sick attendants.

Additional Hospital Accommodation.—In addition to Queen's House, the large Naval canteen was turned into a hospital, also part of the United Service Club and other buildings were converted into temporary hospitals, as accommodation for over 200 was required. Batches of sick and wounded continued to arrive at frequent intervals, also refugees. On July 8th 47 wounded arrived, and the few remaining ladies living on the mainland had been ordered to the island.

Majors Clarke and Reilly, R.A.M.C., arrive from Hong Kong.—On July 19th Majors C. F. Clarke and C. W. Reilly, R.A.M.C., arrived from Hong Kong for duty, and were a most welcome addition, as the duties had become very arduous and the staff was inadequate for the work. Major Clarke was put in charge of the Canteen Hospital, with Major Reilly doing duty. The hospitals were now somewhat overcrowded, but it could not be helped; convalescing wounded seamen and marines were sent over to Flagstaff Camp, on the mainland, to relieve the pressure. On July 20th Major Bruce, 1st Chinese Regiment, arrived back wounded, also men of the Royal Welsh Fusiliers, Hong Kong Regiment, and Chinese Regiment. The British soldiers were treated in the Canteen Hospital; those of the Hong Kong and Chinese Regiments were put in the East Village Hospital. Indian troops were now passing through on their way north, and some were landed here, remained for a short time, relieved by another regiment, and so on. Some of the base staff of the China Expeditionary Force landed and made their headquarters on the island. Stores, &c., were landed. On July 22nd I had an interview with Colonel Bookey, I.M.S., principal medical officer of the force, and strongly recommended that the fine Hotel Victoria, close to Mahto, and now nearing completion, should be taken over as a hospital. However, nothing could be definitely decided without the sanction of the General Officer Commanding, who was detained at Shanghai. Colonel Lorne Campbell, Colonel on the Staff Commanding Base and Lines of Communication, was now in military command here, the garrison being under the General Commanding the Expedition. On 23rd more wounded arrived, and a detachment 24th Punjaub Infantry landed on mainland. On 26th Major H. E. Cree, R.A.M.C., arrived from India, with one section (25 beds), of a field base hospital, and assumed duties of senior medical officer, and pitched his section on a good site on the island. A few days afterwards a Native General Hospital, in charge of Lieut.-Colonel Waddell, I.M.S., and a full staff, arrived and took up a good position above and close to the East Village on the island.

Principal Medical Officer Base and Lines of Communication in Medical Charge.—Lieut.-Colonel Esmonde-White, I.M.S., arrived, and took over medical charge as Principal Medical Officer Base and Lines of Communication, China Field Force. Major C. W. Reilly, R.A.M.C., was moved up to Tientsin. August 15th, under orders from Principal Medical Officer, the hospital 1st Chinese Regiment was evacuated, and the sick transferred to the Native General Hospital, on the island. I myself was moved to the island and attached to the British Field Base Hospital for duty, and put in charge of the officers' hospital, and also to do sanitary duty for the whole island, under the Principal Medical Officer.

Enteric Fever.—Hitherto enteric fever had not occurred in the command: but by now several cases had been sent down from the front (all seamen and marines), and were under treatment here. Several of the attendants on the sick caught the disease, and other cases followed. On August 30th three nurses of the Indian Army Nursing Staff arrived, and also Captains Spencer and Buswell, R.A.M.C., from India. I obtained the services of a body of Indian followers as a sanitary corps, who did good service. All efforts to provide a paid assistant sanitary inspector failed, as no one could be found to take the post. On September 24th Major-General Dorward, C.B., D.S.O., returned, and resumed the post of Military Commissioner and command of the garrison. In October I returned to the mainland and resumed medical charge of the 1st Chinese Regiment and Civil Hospital. The 28th Madras Infantry landed on the mainland, to remain for the winter. On October 24th the 1st Chinese Regiment returned from the north to their old quarters. In addition to other duties, I perform that of sanitary officer for Ma'tou. The Hotel Victoria was taken over as a general

hospital for native troops and occupied for the winter. It is a fine double-storied building of stone and brick, well situated on a cliff, and overlooking the harbour, about a quarter of a mile to the east of the 1st Chinese Regiment barracks. The 28th Regiment of Madras Infantry occupied a portion of the 1st Chinese Regiment new barracks as winter quarters.

1st Chinese Regiment.

Temporary Barracks.—There has been some overcrowding at times, owing to want of sufficient accommodation, but without any ill effect on the health of the men. The remarks made in my report of last year, as regards the nature of the buildings, &c., hold good. Some of the barrack-rooms in the new barracks have been taken into occupation.

Ventilation is indifferent, when doors and windows are kept shut.

Heating is by stoves burning coal, and is sufficient.

Latrines and Urinals.—The new pattern latrine, all cemented, and without wooden seats, has been tried, and proved successful. It should be introduced throughout the barracks.

Ablution rooms, being open, are not usable in winter, when it is a difficult matter to get the men to use much water. Improved means for ablution are required.

Baths.—There are none, and as these barracks are likely to be occupied for a long time to come, I would recommend that some baths and bath-rooms be provided.

Kitchens appear to be sufficient and suitable. Native cooking ranges are in use.

Rations have been of good quality. The cooking appears to be satisfactory. The men receive a free ration of :—

Rice, 1 catty
Flour, ½ catty } daily.
Wood, 1 pound
and Beef, 1 pound once a week.
(1 catty = 1⅓ pound English.)

The above ration does not appear to be on a liberal enough scale. The quantity of flour is too small and might be increased with benefit, and the rice is not sufficient for two meals. I would recommend an increased quantity of both.

Water Supply.—Two large new wells have been sunk near the old shallow one in use (*vide* last year's report), and the remarks made in last year's report still apply. The supply appears sufficient and of good quality.

Clothing is suitable to climate and season.

Boots.—Ammunition boots have been taken into use and proved satisfactory ; they are liked by the men.

New Barracks, Site of.—The new barracks for the regiment occupy an elevated site above and a little to the west of the village of Ma'tou, and are practically built on the rock, which is of igneous origin and disintegrates readily when exposed to atmospheric influences. They face the south, and there is a very good slope for drainage, so that the site is a dry one and is open on both sides, being on a spur coming down to the shore from the adjacent hills at the back. There is a ravine on either side. Behind, the spur rises steeply to a range of hills some 850 feet in height, which give protection from the north wind. In front is the sea beach and Wei-hai-Wei Harbour. At present the barracks are not finished ; but the 28th Madras Infantry is quartered in them for the winter, and three companies of the 1st Chinese Regiment occupy barrack-rooms.

Barrack-rooms.—Two rooms are continuous with one another, partially divided by a partition wall open in the centre. Each room is for sixteen men.

Superficial area per man,		49 square feet.
Cubic space	,,	590 cubic feet.
Glass	,,	5 square feet.

New Barracks.—The walls are built of stone, with partition walls of brick, and the roofs of Chinese pantiles. Each block is for a half-company and

contains four rooms for sixteen men each. At either side of the entrance to the barrack-rooms are two small closets, one on each side, for night urinal, and mops, &c.; these are shut off from the barrack rooms by doors. In the centre of each block is a company store-room, 10 feet × 15 feet, and a native non-commissioned officers' room, 13 feet 4 inches × 9 feet 8 inches, for two non-commissioned officers.

Heating is by "Magnet" stoves, one at the end of each room, and one in the centre between two rooms, which appears to be sufficient.

Ventilation is amply provided for, and in summer the windows can be kept open.

Kitchens are supplied with native cooking ranges and afford ample accommodation.

Latrines and Urinals are of the new pattern and palatial in character, each place being closed off from the next one, and they meet native requirements. The floors are all of cement, and the urinals of slate.

New Barracks afford good accommodation. Water is not laid on.

Ablution-rooms.—Bath-rooms are provided.

Water Supply.—New wells have been sunk in the vicinity of the barracks, from which, it is thought, an ample supply of water will be obtainable. On examination at the Municipal Laboratory at Shanghai, the water was found to contain an abnormal number of bacteria, but none of a pathogenic character. After the lapse of three months, a further bacteriological examination still showed a large number of bacteria present, viz., 25,000 per cubic centimetre, probably of a temporary nature. The water was recommended to be boiled or filtered. Since then the water has been in use for some months, and no sickness whatever has resulted that could be supposed to be due to the water. The wells are some thirty feet deep, and bored through solid rock. It remains to be proved whether the wells will furnish sufficient water through a very dry season when the barracks are fully occupied. If water could be pumped into a cistern and distributed to the various parts of the barracks, it would be a great convenience and save much labour. The Berkefeld filter should be in use at the barracks. The Indian field forces are supplied with them, and I believe they have proved most satisfactory.

Climate and Meteorological Observations.—The year under consideration has been hotter and even drier than last year.

Rainfall.—Total rainfall for the year was only 15·76 inches, which fell on 73 days. July and August were the wettest months. A heavy fall of snow in December gave over two inches of water. The previous year was considered a dry one, with a rainfall of 22·36 inches in 66 days.

Temperature.—June, July and August were the hottest months, highest temperature recorded being 96°. January, February and December were the coolest months, lowest recorded temperature being 15° F. The mean daily range was 12·29.

Barometer.—The barometric observations were equable.

There was very little fog this year, compared with last. High winds were less prevalent than last year. In winter, with a strong north or east wind, the cold is intense. The climate is much superior to that of Hongkong or Shanghai. I am indebted for the data, from which the tables on pp. 488 and 489 were compiled, to the courtesy of Lieut.-Colonel C. Penrose, Commanding Royal Engineers.

Strength.—The strength of the regiment varied a good deal from time to time. In July the strength was 620, average for the month, whilst in September it had fallen to 365. In December it rose to 704, and now (January, 1901) is nearly 1,000 strong. Average strength for the year:—British officers, 11; non-commissioned officers and men, 490.

OFFICERS.—*Deaths.* Two deaths occurred—Captain Hill, who died from the result of burns, due to an accidental explosion of gunpowder at Tungchow; Lieutenant Ollivant, killed in action.

Wounded.—Two wounded. Major C. D. Bruce sustained a gunshot wound of the abdomen from a Mauser bullet at Tientsin on July 6th. The medical officer who attended him up there noted that "the bullet entered the right side of the back and emerged just below the right costal arch, traversing in its course the base of right lobe of liver." There was much

shock at the time, but the wounds speedily healed up without any trouble, and the patient was convalescent, when he, probably due to over-exertion, developed some phlebitis of the femoral vein of his left leg. He was granted two months' sick leave by a medical board, to Japan; on his return he resumed duty. Major G. Periera received a slight gunshot wound of elbow, from which he perfectly recovered.

Sick.—The general health of the officers, 1st Chinese Regiment, has been very good during the past year. Captain H. R. James had a severe attack of non-malarial remittent fever in April, but recovered under treatment with methylene blue. As he was convalescing he got a chill and developed pleurisy, with effusion on the right side. On recovering from this, phlegmasia dolens of his left leg suddenly appeared. He got better, and was sent to Japan on two months' sick leave. Afterwards, having made a good recovery, he went on active service, and has since been doing duty. One officer had a mild attack of influenza, keeping him in bed for a week. There were no other cases of any importance.

British Non-Commissioned Officers, 1st Chinese Regiment.—Their health has been very good during the past year. Average strength, 11.

Wounded and Sick.—Colour-Sergeant Purdon sustained a gunshot wound (Mauser bullet) through the muscles of calf of leg. He made a good recovery. He was transferred from Tientsin to the British General Hospital, Wei-hai-Wei, for treatment, as was also Colour-Sergeant Bunting with remittent fever, who had a very severe attack and made a good recovery.

Deaths.—One death occurred, that of Armourer-Sergeant Williams, aged 30, service 7½ years, who died of enteric fever. This non-commissioned officer had been up to the front with the regiment, and returned to Wei-hai-Wei on October 24th, apparently in his usual health, and did his duty till December 20th, when he complained of not feeling well. On the 24th he was admitted to the British Base Hospital, and was diagnosed enteric fever. He suddenly collapsed and died on December 28th. The origin of this case could not be traced with certainty. No previous case had occurred on the mainland; but as it was prevalent on the island and he had visited there, he probably contracted the disease from that locality. There was no other case of sickness of any importance among the British non-commissioned officers.

Native Non-Commissioned Officers and Men.—The following summary of the sickness and casualties in the regiment is as complete as I am able to make it. I have no means of knowing how many sick there may have been at the front, or while I was absent from the regiment.

Deaths.—9 killed in accidental explosion at Tungchow.
7 killed in action.
2 died of wounds at Tientsin.
2 drowned on active service.
1 died on furlough.

21 Total.

Native Non-Commissioned Officers and Men wounded.—Eleven men were wounded. With the exception of the two who died of wounds at Tientsin, they made a good recovery. The gunshot wounds were inflicted, for the most part, by Mauser bullets, the humane nature of which is now well known. The following cases were under my treatment, being transferred from Tientsin.

No. 99, Corporal Yee Ping, gunshot wound, right shoulder. Wound of entry, 2 inches below acromion, passing downwards, backwards, and outwards; wound of exit, in upper third of arm. Both wounds were somewhat large, and there was a good deal of suppuration. No fracture present, but the bullet had evidently grazed the bone, of which some exfoliations came away. The wound continued to discharge for some time, but eventually healed up under antiseptic treatment, and the patient made a perfect recovery.

No. 448, Shüyu, wound, gunshot, face. A Mauser bullet entered in the middle of his left cheek, 1½ inches below the left orbit, passed downwards

1899.	Temperature.						Barometer.				Rain or Snow.	
	Highest in Month.	Lowest in Month.	Range in Month.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Highest in Month.	Lowest in Month.	Mean for Month.	Range.	Number of days it fell.	Amount collected.
												inches.
January	48	14	34	43·7	25·2	18·5	30·54	29·85	30·24	·69	4	·14
February	52·5	20·5	32	42·3	28·1	14·2	30·33	29 97	30·16	·36	3	·09
March	64	29	35	49·8	39·7	10·1	30·29	29·57	30·04	·72	4	·31
April	80	33	47	61·2	45·9	15·3	30·28	29·52	29·75	·71	2	·01
May	88	50	38	74·6	57·01	17·6	29 90	29·55	29·81	·44	5	·06
June	84	56	27·5	77·2	63·21	14·0	29·82	29·22	29·59	·60	13	4·20
July	88	63	25	80·7	70·9	9·8	29·63	29·28	29·48	·35	11	0·59
August	91·5	64	27·5	82·5	72·3	10·2	29·81	29·30	29·62	·51	6	3·71
September	85·5	53	32·5	77·8	64·7	13·1	30·05	29·99	29·88	·06	5	1·81
October	76·5	41·5	35	63·12	51·9	11·2	30·32	29·74	30·00	·58	5	·04
November	65	32	33	52·81	40·8	12·01	30·41	29·82	30·14	·59	4	·07
December	54·5	20	34·5	42·83	31·79	11·04	30·35	29·78	30·11	·57	5	·59
Mean	73·12	39·6	33·41	62·38	49·29	13·0	30·80	29·63	29·89	·51	66	22·80

1900.	Temperature.						Barometer.				Rain or Snow.	
	Highest in Month.	Lowest in Month.	Range in Month.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Highest in Month.	Lowest in Month.	Mean for Month.	Range.	Number of days it fell.	Amount collected.
												inches.
January	42	15	27	30·25	22·09	8·16	30·60	30·00	30·29	·60	6	·19
February	49	15	34	38·67	25·58	13·09	30·45	29·95	30·16	·50	2	·04
March	58·5	21	37·5	46·43	33·69	12·74	30·28	29·66	30·00	·62	3	·92
April	80·5	31	49·5	55·46	43·71	11·75	30·15	29·62	29·92	·53	7	·44
May	87	45	42	70·79	54·77	16·02	29·88	29·17	29·60	·71	5	1·55
June	93·5	55	38·5	75·13	61·08	14·05	29·85	29·38	29·65	·47	9	1·84
July	93	64	34	82·08	70·33	11·75	29·77	29·31	29·51	·46	7	3·83
August	93	67	26	83·63	70·20	13·43	29·86	29·34	29·56	·52	9	3·17
September	85·5	59	26·5	79·65	67·86	11·79	30·11	29·64	29·83	·47	4	·44
October	77·5	43	34·5	66·61	54·18	12·43	30·22	29·66	30·00	·56	9	·98
November	70	29·5	41·5	53·57	40·43	13·14	30·31	29·78	30·08	·53	3	·28
December	53·5	17·5	36	39·12	29·98	9·14	30·38	29·89	30·19	·49	9	2·08
Mean	73·83	38·5	36·4	60·11	47·82	12·29	30·90	29·61	29·89	·53	73	15 76

and inwards, through the superior maxilla, breaking two molar teeth in upper jaw, through the left side of his tongue and floor of his mouth, making its exit on right side of neck, below inferior maxilla. There was some suppuration from superior maxilla, and I removed some remains of broken teeth. He made a perfect recovery.

No. 431, Private Su Te Sheng, bullet wound through upper third, right forearm, also non-penetrating wound of abdomen, gunshot. Both healed up rapidly.

No. 298, Private Wang Tsung Fa, bullet (Mauser) wound of chest, penetrating in close proximity to apex of heart. No bad symptoms ensued, and patient made an uninterrupted recovery.

No. 296, Private Su Ta Sun, bullet wound of right arm, recovered perfectly.

No. 337, Corporal Su Ting Fa, wound, gunshot, of arm and hip. The iliac bone below the crest was injured in this case, and suppuration lasted a long time. Some bone was scraped away, and eventually the patient made a good recovery.

The total admissions to hospital for the year was 454.

General Diseases.

Small-pox.—There has not been a single case.

Cow-pox.—Two cases only, following vaccination, neither of which were severe.

Vaccination.—The officer commanding did not deem it advisable to make vaccination compulsory, but I obtained permission to vaccinate any men who did not object, and practically I managed to vaccinate all the men who did not possess satisfactory marks of previous vaccination or small-pox. The lymph was obtained from the Public Vaccine Institute of Shanghai at a moderate cost and proved of excellent quality. A total of 367 men of the regiment were vaccinated by me (of whom 104 were primary vaccinations), with 7 failures, 263 re-vaccinations, with 22 failures, several of whom had had small-pox. I also vaccinated any children of soldiers, or others, who wished it done. The regulations regarding British troops are duly carried out.

Influenza.—This disease was brought here by a man-of-war. The type was mild, and though several men had it, only two required admission to hospital.

Simple Continued Fever caused eleven admissions. No case was very severe, and they all recovered.

Dysentery only caused thirteen admissions, which is a good deal less than one may usually expect here. I attribute this partly to the dry weather. Ipecacuanha acts very well on the Chinese in curing this disease.

Ague.—One case only, in a man who had contracted the disease elsewhere.

Remittent Fever.—Six admissions. The malarial cases had been contracted elsewhere. The others, four in number, were apparently non-malarial and proved mild, and recovered under treatment with methylene blue.

Tubercle of Lung.—One case. He was discharged as unfit.

Primary Syphilis.—Twenty-five admissions. Several of the cases were very mild.

Secondary Syphilis only gave nine admissions, and none of the cases were serious.

Gonorrhœa gave thirty-eight admissions. Many of the cases were complicated with bubo, and a few with orchitis or epididymitis.

Scabies.—Eighteen admissions, is very common, and mostly was found in recruits.

Tænia Solium.—One admission, though many were treated for tænia as out-patients not requiring admission to hospital. It is very common amongst the Chinese.

Ringworm.—Two admissions.

Rheumatism.—Nine admissions, brought on, as a rule, by getting wet. All recovered.

New Growth, Non-malignant.—One admission. It was removed, and has not recurred.

Anæmia.—One admission. No specific cause could be found. The case was severe. Recovered.

Debility.—Four admissions. All recovered.

Diseases of Eye.—Blepharitis gave one admission. Conjunctivitis gave ninety admissions. This is one of the commonest diseases amongst the Chinese, and gives the largest number of admissions for any single disease. Patients are very liable to relapses. The Chinese race seems to be particularly prone to this complaint, and it is much aggravated by their want of cleanliness. Efforts have been made to decrease the number of cases, and as the men become cleaner in their habits it should improve matters. Better accommodation for ablution has been recommended. Ulcer of cornea, six admissions. With one exception, readily amenable to treatment.

Diseases of Ear.—One case of inflammation of external meatus.

No case of disease of *circulatory system* was admitted.

Respiratory System.—Bronchitis gave three admissions only. All recovered. Catarrhal bronchitis gave twenty-two admissions, all of a mild type. Spasmodic asthma, one case, recovered. Pneumonia, acute, one admission only. This patient had been badly burnt in a gunpowder explosion, on recovery from which he went to visit his home. On his return from furlough he came into hospital with pneumonia of the right side. The case has become of a chronic nature and is apparently developing into phthisis. Pleurisy, two admissions. Both made a good recovery. The Chinese show a remarkable exemption from severe diseases of the respiratory organs in this part of the country.

Digestive System.—Abscess dental periosteum caused three admissions. Sore-throat, ten admissions, none severe. Hæmatemesis, one case, cause uncertain. Recovered. Tonsillitis, two cases. Recovered. Dyspepsia gave thirteen admissions. Is a common complaint among the Chinese, and many cases are treated without having to be admitted. Diarrhœa caused seven admissions, mostly due to dietetic errors. Jaundice, seven admissions, of the catarrhal variety, and mostly due to chill. All recovered. Hernia gave one admission. Patient was fitted with a truss and returned to duty.

Lymphatic System.—Inflammation of lymphatic glands gave seven admissions. All recovered.

Urinary System.—Cystitis one case, recovered.

Generative System.—Soft chancre gave fifty-four admissions, often complicated with bubo. Is the commonest form of venereal disease here. Orchitis (not gonorrhœal) one admission, due to a blow, recovered. Ulcer of penis (not venereal) two admissions.

Organs of Locomotion.—Ostitis one admission, due to a blow, tibia affected, recovered. Synovitis of knee joint, three admissions.

Connective Tissue.—Inflammation of connective tissue gave four admissions. Abscess caused twenty-nine admissions. All recovered.

Diseases of Skin.—Eczema, two admissions only, recovered. Ulcer, six admissions, recovered. Boils gave fifteen admissions.

Local Injuries.—Wounds, two admissions. Sprain, nine admissions. Blisters of feet, one admission. Wound, gunshot, of leg, cicatrix broke down, but healed readily under treatment. One case of ranula was admitted and cured by removing a slice of it, laying it well open at same time.

General Health of the Regiment.—The health of the regiment during the past year has been good, despite the fact of its having been on active service. At the latter part of the year there was an increase in the amount of sickness, which reduced the standard of health to "fair" only. This I attribute to the following facts:—(1) Many men returning ill from active service; (2) an increase in venereal disease, many cases having been contracted in Tientsin; and (3) the men returning home with a good deal of money led to greater indulgence.

Temporary Hospital.—The permanent hospital is not yet built, and the temporary hospital described in last year's report has been in use. The accommodation it afforded being found insufficient, E.P. tents were used during the warm weather for additional accommodation. When the cold weather came, barrack-rooms were temporarily lent to accommodate patients for whom there was no room in hospital. As the strength of the regiment increased these rooms were required for use by the officer commanding, and an addition

to the temporary hospital of two new wards for sixteen patients each, with a latrine, kitchen, store-room, and non-commissioned officer's quarter, were sanctioned by the General Officer Commanding and immediately put in hand, and will be in occupation shortly. The sanitary condition of the hospital has been satisfactory. The permanent hospital will be taken in hand as soon as the winter is over, and will probably be finished before the end of the year (1901). The foundation had already been commenced before the cold weather put an end to the work.

Hospital Staff is still wanting. I obtained permission to engage the services of a Chinese who had some knowledge of medical work as a hospital dresser, on a salary of ten dollars per mensem. I have also had the temporary services of a second grade Indian hospital assistant lent me by the Principal Medical Officer Base and Lines of Communication, China Field Force, who is of great assistance, as he is able to dispense. When the Indian force leaves, which will probably be in the spring, I shall again be without the services of even a dispenser. No Chinese non-commissioned officer can be obtained for the hospital to keep discipline, &c. A European is indispensable. The hospital is non-dieted. I sent proposals for suitable diets in my report of last year. The supply of medicines, surgical materials, &c., during the past year has been of good quality and adequate for all purposes. When the regiment went to the front I was able to supply it with field medical equipment in accordance with the regulations, and first field dressings had been obtained from Hong Kong.

Recruiting has been going on during the whole year, during which I have examined 833 recruits, of whom some fifty were unfit. The chief cause of rejection is defective vision. About 1,700 recruits have been passed since the regiment was first raised. The general physique of the regiment is good. No gymnasium has been started, but the men do physical drill. The best class of men come from the agricultural population.

The Island of Liu-kung.

Progress Made during the Year.—A great deal of work has been done on the island during the past year. New roads have been made, and in the military portion of the island, to which this report refers, the surface drains have all been cemented, and new ones constructed where required. New buildings have been erected as quarters, and many old Chinese houses converted into barracks and quarters for British troops.

The addition to the garrison of half a company of Royal Engineers and a battery of Royal Artillery with their officers have all been housed in good temporary quarters. The followers have also been provided for, and the staff of the base of the China Field Force. A good deal of progress has been made in the construction of forts.

Many new wells have been sunk.

The part of Queen's House used as a hospital has been altered and fitted up for a winter hospital for British troops, and is now the British General Hospital. Quarters for the medical officers and nursing staff who came from India have been provided.

A room in Queen's House has been fitted up as a temporary church.

A large jetty was constructed, which proved most valuable for the landing of wounded and sick, commissariat, stores, &c.

The iron pier has been repaired and is now usable.

No permanent barracks have, as yet, been commenced.

A prison and cells have been provided.

Steps have been taken to improve the sanitary condition of the island, which was in a decidedly bad state. A contractor has been employed to remove nightsoil, and many cesspools have been cleaned and closed. Much remains to be done, and the services of a paid sanitary inspector are much required, but have not yet been obtainable. Now that the Colonial Office has taken over the place, it is to be hoped that more may be done, and that a rapid improvement will be the result.

Until the arrival of the troops for the China Expeditionary Force, there was only a small detachment of Royal Engineers, consisting of 2 officers and about 17 non-commissioned officers and men, whose health was very good, no case requiring admission to hospital.

Enteric Fever amongst British Troops.—Since the sick came down from the front and the garrison has been increased, enteric fever has been somewhat prevalent on the island. Nine cases occurred, including one from a ship, with two deaths. The original source of the disease was undoubtedly the cases sent down from the north for treatment in the Naval Hospital. Several sick attendants in the Naval Hospital in the canteen contracted the disease, which was, throughout, more prevalent at the east or naval end of the island, among the marines and bluejackets. It is to be feared that there may be a recrudesence of the disease next summer. The Canteen Hospital has now been burnt down as a measure of precaution. As the patients were treated in the British General Hospital, I refrain from any more detailed report on the subject.

Plague.—Although prevalent in Hong Kong and other ports, fortunately no case has yet been brought to this locality. Nevertheless it is very important that precautionary measures should be taken to prevent the introduction of this disease, especially as direct ship communication exists with infected ports, and the voyage is of short duration.

Dual Control on Island.—From a medical point of view it is a very unsatisfactory state of things that the small island should be under a dual control, and more especially as the Navy claim the most thickly populated portion—in fact, one may say the entire business portion of the island. Whilst doing sanitary work on the island this year, I had to draw attention to the very insanitary and neglected condition of this portion of the island. Jungle had been allowed to grow everywhere, and drains were in a beastly condition. For a long time the Canteen Hospital had no incinerator, and typhoid stools were at the mercy of ignorant Chinese coolies. Eventually an incinerator was erected at the instigation of the military authorities.

Well Water.—The water of a good many wells on the island was examined, and as a result some were closed, others cleaned, &c.

Rinderpest.—This broke out among the cattle. Many died, and others were destroyed. As a result the milk supply entirely stopped, and tinned milk had to be taken into use.

Wei-Hai-Wei city still remains a blot on the territory, being under Chinese administration, and in a very insanitary condition. It is to be hoped that it may be taken over, or at least administered by the British. The sanitary condition of Ma'tou has been somewhat improved, and I now have some coolies permanently employed in the work, but much remains to be done. Increased public latrine accommodation is wanted, and has been found to be very useful in Singapore, where there is a large Chinese population. It will be supplied as funds become available.

Cantonment Hospital.

During the past year, in addition to my other duties, I have been performing that of civil surgeon. The police and civilians in the employ of Government, also the large number of labourers (over 2,000 employed on the Government works) have had no other means of medical treatment, besides the ordinary population. A great many cases have received relief during the year; and in June a temporary cantonment and lock hospital was established by the Commissioner in the village of Ma'tou, and has proved most useful. Later on it was enlarged, and now there are wards for male and female patients in separate buildings, capable of accommodating 25 in-patients. As this becomes better known in the district I anticipate a considerable increase in the number of patients. Several hundred cases have been treated during the year. Among the more serious cases have been the following admissions:—

Multiple Injury.—Three cases of injury from blasting operations. One case had serious injury to the face and hand, including compound fracture of the jaw, loss of one eye, the other being in a critical condition for some time, and he eventually made a good recovery and returned to work. Another had his face, chest, and hand badly burnt and his eyes injured. One eye sustained some permanent damage, otherwise he got quite well. One severe wound of arm, from premature explosion, recovered.

Fractures.—These occurred among the coolies on the Government works, except two cases of poor civilians.

1 fracture, both bones, leg.
1 fracture, both bones, forearm.
1 fracture, fibula.
1 fracture, tibia.
1 fracture, compound, of both bones, forearm, in a boy.
1 fracture, both bones, leg.
1 fracture of pelvis, with rupture of the bladder.

All these cases did well and recovered. The fracture of the pelvis was a very serious case, owing to the bladder complication. The accident was caused by his being crushed under a junk that was being repaired on the beach. He made a good recovery. One coolie was killed by a fall of masonry. This was the only death, I believe, and was due to the men's carelessness.

Stone.—One case of stone in the bladder. The hospital was closed at the time and I was on the island, so the man was operated on at the Native General Hospital, and the stone removed by the suprapubic method with success by a surgeon I.M.S. One case of stone in uretha, of long standing, I removed. Patient did very well.

Compound Dislocation.—A very bad case of compound dislocation of the ankle joint, with fracture of fibula. The patient would not have his foot amputated. The dislocation was reduced and put up in antiseptic dressings, and he went to his home, where he most probably died.

Phosphorus Poisoning.—Five cases of phosphorus poisoning came to me for assistance. How many more there may have been I am unable to say, but this is now the fashionable method of committing suicide. Common Japanese matches are very cheap; the heads are removed and mixed with some fluid and taken. Most of these cases are due to trivial causes, such as a quarrel or resentment against a relation. Of these, two died, one male and one female. I was not sent for till the day after the poison had been taken, so there was not much hope. The man did not die till the ninth day after taking the poison. He was jaundiced, and died from coma. The other three recovered under use of stomach pump, &c., being seen in time. From two to four boxes of matches were usually stated to have been taken. The boxes are small.

Gunshot Wound, Palm of Hand.—A peasant, taken prisoner after the affray on the frontier, was shot through middle of palm of hand, and yet recovered with a good hand, only two fingers being permanently injured. Another prisoner had a penetrating wound of his abdomen and made a good recovery. Really there is no saying what a Chinaman cannot recover from in the matter of wounds. Another case of penetrating wound of abdomen, in which some four inches of omentum was hanging out, was treated. The case was of some days' duration when first seen, and peritonitis was present. He improved under treatment, but was removed to his home before he was well by his parents.

Two operations for removal of necrosed bone in old sinuses were successful. One circumcision was done. One case of gangrene at root of penis recovered. A considerable number of eye cases were treated. Granular lids are fairly frequent.

Several females have come for treatment. Two miscarriages were treated, also cases that aborted. One tumour of the neck, partly cystic, which did not admit of removal, was tapped, and inflammation set up in the cyst, the result being very beneficial.

One death only occurred in hospital, that of an old man with chronic bronchitis and heart disease.

Altogether the hospital is doing good work, which I venture to think is appreciated by the people, especially as it is all free. People often come in from many miles away in the country to ask for treatment. Unfortunately some of the cases are beyond any means of alleviation. Much venereal disease has been treated, and it is hoped in time that it will effect an appreciable difference in the admissions for that disease among the troops.

APPENDIX No. VIII.

THE DISTRIBUTION OF MOSQUITO LARVÆ ON WAR DEPARTMENT LANDS IN SIERRA LEONE.

By Captain (Local Major) F. SMITH, R.A.M.C.

Now that Malarial Commissions are covering the West Coast in every direction with a view to the extermination of the insects known to carry the disease which the Commissions are grappling with, it may be interesting and instructive to place on record this account of an eight months' study of the distribution of the mosquito on military lands at Sierra Leone.

The paper deals chiefly with the military stations in and around Freetown in the Colony proper as distinguished from the Protectorate or Hinterland.

The four principal stations in the Colony are Tower Hill, Mount Aureol with Kortright, Wilberforce and King Tom. There are also small detachments in some of the forts and electric light stations; but these are mostly in or about infected areas in the town itself and may be left out of consideration here.

The observations began in June, 1901, when the "rains" were setting in, and continued to the end of January, 1902, by which time the "dries" had been established for some weeks.

Tower Hill barracks are 400 feet above sea-level on a conical hill of the same name in the centre of Freetown, but separated on all sides from the town houses by a belt of clear grassy slope of some 200 yards in width at its narrowest part. On the northern slope, 200 feet above sea-level, 200 yards from the town and nearly 200 yards from the barracks, is the Station Hospital, Tower Hill.

There are no breeding-places of anopheles on the hill, but the "Grass Fields" district, a low-lying, badly drained part of the native town beginning at the foot of the south-western slope, is full of them. There are also breeding waters in the portion of the town near the foot of the hill on the north-east. Other parts of the town provide breeding pools from time to time in the rains, and after some engineering operations had formed a suitable place a member of the Liverpool Malarial Commission found some in the middle of the dry weather alongside the tennis courts and Government wharf, the most popular evening resort of the European community, on the sea front to the north, a quarter of a mile from the station hospital. In the dry weather a brook about a quarter of a mile south and south-east contains larvæ. It will be seen, then, that Tower Hill is pretty well surrounded by anopheles, but more especially east and west.

During the rains culex and stegomyia larvæ may be found in depressions in the rocks in the barr[illegible] and in old tins, &c, on the grassy slopes outside from th[illegible] can only be prevented from arriving at the winged [illegible]nt effort on the part of the medical officer.

Anopheles mosquit[illegible]arracks, but to a much [illegible]roximity of [illegible] the

mosquitoes find all the food they want in the native town they do not take the trouble to fly up the hill in search of it, or in other words that if we had no native town around the hill there would be more mosquitoes in the barracks.

In the dry season Tower Hill is absolutely free from larvæ, but adult culex and a few stegomyia are constantly to be found in the neighbourhood of the swimming bath and latrines. The sound of running water probably attracts them to the bath and some of the urinals, but inasmuch as the latrines are not provided with water it may be presumed that fœcal odours are an attraction. The barrack water supply comes from a large uncovered iron tank filled by gravitation through a pipe from a stream in the higher hills near Mount Aureol. The tank is practically always full to overflowing, and the waste pipe leads into the swimming baths, which are also always at overflow. Tank and baths seem absolutely free from larvæ (from June to January at all events), and this can be accounted for by the fact that the water is constantly on the move and eggs deposited therein must be carried off before they have time to hatch out.

It may be assumed, therefore, that much of the fever among the occupants of the barracks is contracted in the town, though it can be easily seen that even one infected mosquito in the barracks would be likely to infect a good many men, inasmuch as the barrack rooms are large and connected more or less by verandahs and staircases. The men, moreover, do not use mosquito curtains.

Mount Aureol is a hill some two-thirds of a mile to the east of Tower Hill, from which it is separated by a valley. The bottom of the valley contains native houses, and its sides are clothed with verdure—grass on the Tower Hill side, trees and grass the Mount Aureol side, which is far the longer and steeper of the two. The nearest native houses to Mount Aureol are a quarter to one-third of a mile distant downhill in the western and northern directions. To the east and south there are no native villages for over a mile. The summit of the hill is a ridge running north and south. At the northern end about 700 feet above sea-level is the station hospital; about 150 yards as the crow flies, to the south and farther uphill (to 800 feet above sea level), are the officers' quarters, and close to them the men's barrack huts. Then comes a slight dip of some 50 yards, after which a sudden rise southwards to Kortright Hill (1,100 feet above sea-level), on which are Head Quarter House, barracks for one company and a small convalescent hospital. The distance between Mount Aureol and the nearest building on Kortright is about 400 yards.

The actual barrack sites are entirely free from larvæ of anopheles, but during the rains culex may be found of course in tins and broken bottles here and there. During the early part of the dry weather culex are found in a watercourse cut out of the hillside by the overflow of surface water from the barrack drains at Mount Aureol. A series of pockets are formed in which water stagnates when the rains are intermittent, but all of them are quite free from water soon after the "dries" are established.

So far anopheles, in the winged stage, have been found in small numbers only on Mount Aureol, and not at all on Kortright; experience, however, has taught us that this goes for very little in lofty barrack rooms with white-washed walls. But the most interesting thing in this connection about the hill stations named is a mountain stream, over two miles in length (Nicol Brook), which runs along the western side of both places and passes on through Freetown to the sea. This stream is perhaps 150 yards from Mount Aureol and 250 from Kortright; some 100 feet below the one and 150 below the other at the nearest points. The brook is in its whole extent fringed by a wide, dense margin of trees and natural undergrowth. It has a very irregular rocky bed, and during the rains anopheles larvæ are of course absent in a general way from the bed owing to the violent rush of water. They were found, however, in small numbers in one or two pools on the banks and in a small grassy swamp some twenty yards in width, alongside the stream as it passes Mount Aureol barracks. (It may be said that since, on suggestion of Dr. Daniels, of the London School of Tropical Med larvæ have been fished for with a white cup—an enamelled i will be found excellent for the purpose—they have b where prolonged gazing on the surface of the water r

As the rains subside a great change takes place. Little holes and pools are left in and between the rocks, and these soon fill with larvæ. They dry up as the season advances, but others are formed by the diminution in the volume of the stream, until by January the whole extent of the brook swarms with larvæ of anopheles and other mosquitoes. A fair number of anopheles larvæ are now to be found in the stream itself, especially among the dead leaves and small driftwood at the still margins of pools, also at the distal end of cracks in the rocks; everywhere, in fact, where they can escape from the small fish and other enemies which live in the brook. This condition will hold, of course, until the rains begin in April and will disappear gradually as the wet weather settles in. Dr. Daniels writes to me that the above is just what he expected, judging from his experience in Central Africa.

During the "dries" larvæ were found also in some very small collections of water in a somewhat choked gutter by the roadside where the hospital road crosses the Kortright road. The water oozes from the rocks near a small public drinking font 300 yards below Mount Aureol.

Wilberforce is situated on a ridge on the 500 feet contour running north and south some three miles to the west of Freetown. It has gained a certain amount of notoriety as a mosquito haunt, and for a long time it was a mystery where they came from. Some breeding-places are now known, but the number of insects in the village seems to be in excess of what might be expected from the extent of the producing areas. Other haunts may be found in the future. The village is small and isolated, however, and probably all mosquitoes in the neighbourhood are attracted to it.

In October they were found in a pool in a swamp about half a mile north-west of the village. This swamp had been searched unsuccessfully before. During the same month they were found in a small stream 500 yards or so in front of and below the officers' mess, that is to the west, whence the prevailing wind blows. The stream had been visited before when it was a torrent and again when it appeared to be quite dry. On this occasion the following curious condition came to light:—The searching party was divided into three proceeding parallel to each other through the jungle due west from the barracks. The two outer parties reported arriving at the dry bed of the stream without finding water on the way. The centre party found the stream running and anopheles larvæ in the eddies. The true explanation was that the water came from a spring in the rocky bed of the stream, ran along for 150 yards and then was lost in the soil. Two months later the spring also had dried up completely.

By this time a stream passing about 200 to 300 yards south-east and east of the village, a stream in which the population washes itself and its clothes, had become infested with anopheles, a small amount of soapiness apparently doing them no harm. The condition of this stream is the same as in the Nicol Brook at Mount Aureol. During the rains no larvæ can live in it, but in all probability there are a few pools connected with it in which they can live. None were discovered. Many larvæ were found on a small irrigation farm which has sprung up this dry season near the head of the stream close to the southern end of the village. This farm ought to supply breeding waters in the rains also. The barracks, it may be stated, are practically in the village of Wilberforce, but schemes are afloat to make a cantonment 600 yards to the south-eastern side of the village (and 150 to 200 yards across the stream) for the native troops, and to remove the Europeans some distance away south-west. The cantonment, of course, will be full of anopheles, but this is comparatively of little importance so long as it is occupied only by native soldiers, who are largely immune.

At *King Tom* peninsula, culex, stegomyia, &c., are found, chiefly during the rains, but anopheles larvæ have not been discovered. Neither have insects. But fever has occurred. The peninsula is naturally drained on three sides into the sea and is perfectly dry very soon after the cessation of
[illegible] rains; but larvæ in abundance are present across the bay a third of a mile
[illegible] to and south of Murray Town, both in the "rains" and "dries."
[illegible] regular west wind which prevails wafts them over the
[illegible] they may proceed voluntarily in the direction of
[illegible] vation (there are very few residents near the
[illegible] we find they come out to ships anchored

half a mile or more from shore. At Forcados River mosquitoes were plentiful on a transport from the Cape within an hour of casting anchor more than a mile off a shore from which a soft breeze was coming. The search for pools at King Tom has been pretty thorough because of its being reputed unhealthy.

At *Signal Hill* a new barrack-room for Europeans has just been completed. There is no water on the hill, and the barrack-room is on the Wilberforce ridge 500 yards north of the village. It is not yet occupied. The nearest breeding spots known are half a mile away, and it remains to be seen whether the place will be unhealthy.

The *Rifle Range* is in the Grassfields district and well provided with anopheles.

In January a camp of instruction was formed on Gloucester saddle in the hills, half a mile south-east of Gloucester village in a dip at the southern end of a hill known as Golgotha and proposed recently as a site for a segregation settlement of European Colonial Officials. Gloucester is about three miles from Freetown, almost due south. A stream rises 150 yards north of the camp, is joined by another rising 300 yards north-west of camp, and runs north-west through Gloucester village. There were larvæ in these streams in January. A collecting tank was put up near the head of the second mentioned. There were many larvæ in the stream around, above and below it. A guard was posted over the tank and men were constantly about getting water, running risk of infection, and probably some of them supplying the means of infecting the insects. Larvæ were also found in smaller numbers on an irrigation farm 100 yards lower down. Between Gloucester village and the camp is a straight valley half a mile or so long, and the houses in the former can be seen from the tents in the latter. A steady west wind blows frequently from village to camp. Adult mosquitoes (anopheles) have been taken in the tents. Gloucester village contains anopheles, and according to Drs. Christophers and Stevens the children are largely infected. Inasmuch, however, as the camp was exceptionally healthy for the first few weeks of its existence, it may be assumed that the mosquitoes found in the tents were uninfected ones bred in the stream close by.

The "bush" stations in the hinterland have not all been visited, but at Port Lokkoh early in December, I found larvæ in a small natural drain at the wharf and nowhere else. The village is built on the side of a hill sloping down to the tidal river. In January this drain was reported to be dried up, but there is little doubt that by then some anopheles pools would have formed in the bed of a stream which runs around one side of the village on its way to the river.

At *Rotifunk* in the rains anopheles were seen in one house perched on the glasses at the dinner table. In December there were none to be seen in the same house. The breeding-places have not been sought for properly, but there is plenty of water all round, and no doubt larvæ are to be found.

When travelling with the Officer Commanding the Troops in the Hinterland in November, I was struck with the difficulty of finding breeding-places in the villages. In the numerous wide grassy swamps a small number were discovered after long search. These swamps are full of small fish, which may account for the scarcity of larvæ. The little fish work their way in and out of fairly dense weed and grass in search of food, and it must be difficult for the larvæ to hide. In some old canoes full of water and in some pools in the rice-fields a good many larvæ were found. Very few adult insects were met with, and on only two occasions during a fortnight's journey did the native servants, who slept without curtains, admit having been bitten. The observations made were in accord with the statements of the villagers as to the prevalence of the insects and also with the popular opinion and experience that in a general way the dry season is the more healthy one in the "bush."

Remarks.

The distribution of anopheles is, then, affected very largely from month to month with yearly regularity by the rainfall, and inasmuch as much of the fever of the West Indian soldier is contracted probably in the towns should expect the greater incidence of fever among them during the s

In Freetown large areas of badly drained lands which are full of anopheles breeding waters during the wet season are absolutely dried up later on; the larvæ are then confined to the streams and a few wells. That, as a matter of fact, rains and fever coincide, or used to coincide, is shown by the following extract from a pamphlet entitled "Notes on Malaria" written by Surgeon-Major E. M. Wilson, C.M.G., and published by H. K. Lewis in 1897; the facts, moreover, encourage us to hope for a much improved state of health in Freetown whenever it becomes properly drained and sanitated generally. But in view of the prevalence of larvæ in the streams during the "dries" the place will never be entirely free from anopheles. The drinking water for the troops is obtained from Nicol Brook, and chemical culicides are therefore out of the question, but apart from that, the herculean task of getting rid of larvæ in the stream is not likely to be taken up.

TABLE I.

Average malarial sick rate and rainfall for five and six years respectively (Surgeon-Major Wilson).

Month.	Non-European troops.	
	Average sick rate.	Average rainfall.
January	50	1·07
February	51	·23
March	65	1·63
April	81	4·35
May	107	14·60
June	147	19·18
July	175	34·43
August	127	35·47
September	102	32·16
October	77	16·70
November	74	4·99
December	57	1·56

At first sight it seems strange that the fever should spread simultaneously with the arrival of the "rains," that is, before new broods have had time to hatch out and become infectious. The probable explanation is that the adult mosquitoes bred in the streams and those which may have lived through the "dries" begin to wander farther afield as soon as there is water in which they can lay their eggs. It may be assumed that the mosquito prefers to live near the water on which it can deposit its eggs, and that it does not travel farther than necessary in search of blood food. The dearth of the insects in some parts of Freetown in the dry season is most likely not due to their death but to migration in the direction of the streams.

An important lesson may be learnt from a study of the distribution of larvæ, and that is, that in selecting sites for new settlements, barrack buildings, &c., it is desirable to have the advice of some one who has had at least a year's experience of the varying conditions due to differents season. A site selected in the "rains" may be unhealthy in the "dries," and *vice versâ*.

Winds in Sierra Leone are very constant and ought probably to be looked upon as a factor of some importance with regard to future sites. They blow mainly east and west. [illegible]rds for 1901 give the chief directions of the [illegible]ast 144 and west 272. If we keep c[illegible]nd becomes a less important [illegible] Ther[illegible]are belt of land [illegible]on it in [illegible]

such a manner as to bridge it over by a series of stepping-stones in the shape of houses. It may be expected that the isolation of Tower Hill will be lost if such a connection with the town is ever complete.

The figures given in the next table show that the admission rate for malaria varies with the distribution of mosquitoes, and that as a result partly of this and partly owing to there being no human habitation nearer than the barracks for the anopheles to feed in, the higher hill stations near the stream sometimes remain unhealthy in the dry weather, while Tower Hill lower down and surrounded a few hundred yards away by native houses becomes less unhealthy than during the "rains."

TABLE II.

Comparative malarial admission rates. Percentage of admissions to strength in 1901.

Non-European troops only.

Month.	Tower Hill.	Mount Aureol with Kortright.
January (dry)	4·8	5·5
February (dry)	4·5	17·0
March (dry)	8·7	17·0
April (early rain)	6·7	12·9
May (more rain)	8·8	6·0
June (more rain)	13·9	4·7
July (much rain)	11·1	4·1
August (much rain)	9·2	2·6
September (much rain)	5·4	2·9
October (less rain)	3·3	2·0
November (drying)	3·1	2·0
December (dry)	3·5	3·1

The gradual increase in the admission rate for the hill stations as the "rains" decline is very striking, and would probably be more so but for the fact that men from both stations are in the habit of spending two or three nights a month in the houses of natives in Freetown.

As regards European troops, who are not allowed to stay in town at night, the figures are still more convincing. In November last a company of artillery arrived in Sierra Leone from England. The men were distributed at once, some going to Tower Hill and a greater number to Mount Aureol and Kortright. The returns for the short time the men have been here are markedly in favour of Tower Hill; bearing in mind, too, that the hills ought to be the healthier for Europeans owing to the altitude. To quote Drs. Stevens and Christophers in their report to the Malaria Committee of the Royal Society:—"At an elevation of 700 feet the atmosphere is fresh and even exhilarating, and one experiences the greatest relief after residence in Freetown with its most enervating foul atmosphere."

TABLE III.

105th Company Royal Garrison Artillery, 1901–2.

Percentage of Admissions for Malaria.

Month.	Tower Hill.	Mount Aureol with Kortright.
December	—	13·7
January	—	20·0

(The Company only arrived on 28th November, and their first admission was on 13th December. If the strength up to that date be excluded, the total in December would of course be still higher.)

The admissions for the whole strength of European troops are not statistically comparable during the earlier three-quarters of the year owing to the fact that a number of the men took turn about living on the flat, and that others are lodged in the town; but among between 30 and 40 non-commissioned officers and men stationed at Tower Hill there was not a single admission for malarial fever during the last quarter of the year. During the same period some were admitted from the town and King Tom, both on the flat. Cases occurred also on the hills. The surprising conclusion arrived at therefore is, that Tower Hill at a comparatively low elevation and in the centre of the town, but separated on all sides by a short stretch of grass land, is our most healthy station. Time will show if this holds good.

The ideal procedure would seem to be, with regard to the European Company, to station them at Mount Aureol while the rains are on and in Tower Hill during the dry weather. The most practicable plan, however, and that most likely to be carried out, is to do everything in our power to prevent the mosquitoes from getting at the patients in hospital at Mount Aureol, to allow no men to be at their duty in barracks with crescents, &c., in their blood, and to forbid the bringing up of soldiers' children in a state of malarial cachexia from the town to the hills for the benefit of their health.

Lieutenant H. A. Davidson, R.A.M.C., rendered me some valuable assistance in watching the progress of events in the waters at Wilberforce, where he is stationed.

APPENDIX No. IX.

INSTRUCTIONS CONCERNING ARMY RAILWAY AMBULANCE CARRIAGES.

1. The carriages will be kept at Netley, and their employment will be subject to the directions of the General Officer Commanding Southern District.

A staff of one non-commissioned officer and five privates, Royal Army Medical Corps (one for each carriage), will be detailed for permanent duty in connection with the carriages by the Principal Medical Officer, Netley.

PLAN OF NEW ARMY AMBULANCE CARRIAGES.

2. When the carriages are not in use this staff will be employed on ordinary duty at Netley.

3. When one or more of the carriages is requisitioned for service the Principal Medical Officer, Netley, will be informed and the staff warned to be in readiness to accompany them; they will join the carriages either at Netley or wherever they may be temporarily housed.

4. The Principal Medical Officer, Netley, will also be informed of the probable time the staff will be absent on each journey, and will see that they are provided with rations for the period.

5. The staff will be responsible that the carriages are clean and the equipment is correct before they are taken into use. A list of the articles in each carriage is given in Table I.

6. The carriages are all identical in construction, arrangement, and equipment, and their general plan with the numbering of each cot is shown in the accompanying diagram, the odd numbers being upper tier cots and the even numbers lower tier cots.

7. Each carriage will be prepared for the reception of sick and wounded as follows:—

(*a*) The cots with bedding properly arranged will be removed and placed on the platform or other convenient place, and, if possible, under cover.

In disembarking invalids from board ship, the patients should be transferred from their berths direct on to the cots, which should be taken on board for that purpose whenever practicable.

(*b*) All the brackets, except those of No. 1 cot, will be folded back.

8. The cots, with the lying-down patients placed upon them, will be carried into the carriage and replaced on their brackets as follows:—No. 1 cot will first be replaced. The brackets of No. 2 cot will then be prepared and No. 2 cot replaced, and so on with the remaining brackets and cots, in the following order:—No. 9, No. 10, No. 11, No. 12, No. 5, No. 6, No. 7, No. 8, No. 3, No. 4. [It will be noted that the upper cot of each pair is replaced first.]

9. Unless a sufficiently large detachment of stretcher bearers is present to enable the loading of more than one carriage to proceed simultaneously, the loading of one carriage must be completed before the next is proceeded with.

10. After all the lying-down patients have been placed in the carriages, the convalescents will be told off, six to each convalescent compartment and six to the seats in the lying-down compartment.

11. All helmets and articles taken by the patients into the carriages will then be neatly stowed away on the racks provided for the purpose.

12. Smoking will not be allowed in the lying-down compartment.

13. On reaching their destination the carriages will be unloaded as follows :—

(*a*) The convalescents will leave the carriages first.
(*b*) Articles belonging to the patients will then be removed.
(*c*) The lying-down patients will then be removed on their cots, which will be lifted from the brackets and carried outside in the *reverse order* to that adopted in loading, the brackets of each cot being folded back before the next is removed. None of the cots will be replaced until all the patients have been taken out.

14. When the carriages are empty the cots will be replaced on the brackets; bedding neatly folded away in the locker, the interior cleaned, and utensils washed and replaced in the locker. This may be done during the return journey.

Articles for cleaning will be drawn by the Principal Medical Officer, Netley.

15. Before leaving the carriages at the termination of the service the non-commissioned officer will see that the equipment is correct, the lockers locked, windows closed, and all doors locked.

16. When all the cots are not required for lying-down patients the empty cots will be formed into seats for convalescents by nesting the upper tier cot on the lower tier cot, and placing the mattress of the latter against the side of the carriage so as to form a back to the seat. The pillows may be used as additional pillows for the patients lying down. The rugs will be spread over these improvised seats, but the blankets and sheets will be replaced in the lockers.

17. Cots nested as in paragraph 16 will be replaced on their brackets at the end of the journey.

18. The keys of the carriages and the equipment will be kept on charge at Netley.

19. A special box containing medical comforts will be issued for use with these carriages (*see* Table II).

20. One of these boxes will be placed in charge of the medical officer who accompanies each party of invalids, and will be returned into store when the journey is completed. The contents will be issued and replenished as necessary from the steward's stores at the Royal Victoria Hospital, Netley.*

Issues made to patients on the journey will be accounted for in Army Book 39, which will be returned with the medical comfort box. At the end of each month the Principal Medical Officer, Netley,† will cause the receipts and issues to be accounted for in Army Form F 736.

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* Or at the Herbert Hospital, Woolwich.
† Or Principal Medical Officer, Woolwich.

Table I.

Equipment of each Ambulance Carriage.

Compartment.	Name of Article.	Number of Articles.	Where kept.
Officers' ..	Rest to convert seats into cot ..	1	In locker behind end seat.
	Knives	24	In locker.
	Forks	24	"
	Spoons	24	"
	Enamel plates	24	"
	" basins, large	12	"
	" " small	12	"
	Wire mattress hooks	2*	"
	Porcelain feeding cups	12	In rack.
	Water bottle (L. and S.W.R.) ..	1	"
	Tumblers (L. and S.W.R.) ..	2	"
	Pillow slips	12	In locker.
	Waterproof sheets	4	"
	Sheets	24	"
	Blankets	12	"
	Rugs	12	"
Lying down	Cots	12	
	Water bottles	6	
	Tumblers	12	
	Camp stools	4†	
	Spittoons	8	
	Mattresses	12	
	Pillows	12	
Convalescent.	Spittoons	2	
	Water bottle	1	
	Tumblers	2	
	Saucepan	1	
	Kettle	1	
	Water can for drinking water ..	1	
	Bed pan	1	In lavatory.
	Bed urinal	1	"
	Water can for water for washing	1	"
	Westinghouse international brake coupling	1	In locker outside.
	Vacuum brake coupling	1	" "

* In one carriage, one hook only, there being nine altogether.
† In two of the carriages there is, in addition, one folding canvas chair.

Table II.

Medical Comfort Box, Railway Ambulance Train.*

Supplies.

....	6 lbs.
ralid (in 4-oz. tins)	1½ "
....	2 bottles.
uct (in 4-oz. tins)	1½ lbs.
densed	6 tins.

e temporarily on charge as follows:—One at Netley, one at oolwich, and three at the Embarkation Offices, Southampton.

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	Pillow slips	12	In locker.
	Waterproof sheets	4	,,
	Sheets	24	,,
	Blankets	12	,,
	Rugs	12	,,
Lying down	Cots	12	
	Water bottles	6	
	Tumblers	12	
	Camp stools	4†	
	Spittoons	8	
	Mattresses	12	
	Pillows	12	
Convalescent.	Spittoons	2	
	Water bottle	1	
	Tumblers	2	
	Saucepan	1	
	Kettle	1	
	Water can for drinking water	1	
	Bed pan	1	In lavatory.
	Bed urinal	1	,,
	Water can for water for washing	1	,,
	Westinghouse international brake coupling	1	In locker outside.
	Vacuum brake coupling	1	,, ,,

* In one carriage, one hook only, there being nine altogether.
† In two of the carriages there is, in addition, one folding canvas chair.

Table II.

Contents of Medical Comfort Box, Railway Ambulance Train.*

Supplies.

Arrowroot	6 lbs.
Bovril, invalid (in 4-oz. tins)	1½ ,,
Brandy	2 bottles.
Meat extract (in 4-oz. tins)	1½ lbs.
Milk, condensed	6 tins.

* These boxes are temporarily on charge as follows:—One at Netley, one at Herbert Hospital, Woolwich, and three at the Embarkation Offices, Southampton.

Mustard	1 lb.
Pepper	1 „
Port	1 bottle.
Salt	2 lbs.
Soap, Windsor	6 cakes.
Sugar	7 lbs.
Tea	1½ „

Equipment.

Canisters, tin	6
Casters, pepper	2
Corkscrew	1
Knife, opening tins	1
Pot, mustard	1
Spoon, mustard	1
Trays, wood	2

APPENDIX No. X.

TABLES, ETC., SHOWING THE RESULT OF PREVENTIVE INOCULATIONS AGAINST ENTERIC FEVER DURING THE YEAR 1900.

Corps or Unit.	Strength.	Number of men inoculated.	Number of men not inoculated.	Cases of Enteric Fever.				Percentage to Strength.			
				Amongst the men inoculated.		Amongst the men not inoculated.		Amongst the men inoculated.		Amongst the men not inoculated.	
				Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
EGYPT AND CYPRUS.											
Cairo.											
11th Hussars	469	—	469	—	—	1	1	—	—	·21	·21
66th Battery, Royal Field Artillery	160	10	150	—	—	2	—	—	—	1·33	—
No. 2 Company, Royal Engineers	80	1	79	—	—	—	—	—	—	—	—
1st Seaforth Highlanders	778	225	553	—	—	1	—	—	—	·18	—
3rd Seaforth Highlanders	598	7	591	—	—	1	—	—	—	·17	—
1st Cameron Highlanders	687	168	519	—	—	1	1	—	—	·19	·19
Other Corps	38	1	37	—	—	1	—	—	—	2·70	—
Alexandria.											
2nd Royal West Kent Regiment	945	228	717	1	1	5	2	·44	·44	·70	·28
2nd Leicester Regiment	874	74	800	—	—	50	4	—	—	6·25	·50
Other Corps	126	1	125	—	—	3	—	—	—	2·40	—
Cyprus.											
Royal Engineers	2	—	2	—	—	—	—	—	—	—	—
3rd Lancashire Fusiliers	100	4	96	—	—	—	—	—	—	—	—
2nd Loyal North Lancashire Regiment	100	—	100	—	—	—	—	—	—	—	—
Other Corps	10	1	9	—	—	1	—	—	—	11·11	—
Khartum.											
1st Seaforth Highlanders	81	—	81	—	—	2	2	—	—	2·47	2·47
Total	5,048	720	4,328	1	1	68	10	·14	·14	1·57	·23

Remarks.—The case among inoculated men at Alexandria was inoculated on 8.12.99, and admitted to hospital 9.1.00. The case ended fatally—16.4.00—and was very severe, complicated by hæmorrhage, phlebitis, sloughing of tissues of back, followed by anæmia and marasmus.

Corps or Unit.	Strength.	Number of men inoculated.	Number of men not inoculated.	Cases of Enteric Fever.				Percentage to Strength.			
				Amongst the men inoculated.		Amongst the men not inoculated.		Amongst the men inoculated.		Amongst the men not inoculated.	
				Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
JAMAICA.											
22nd Company, Southern Division, Royal Garrison Artillery ...	177	44	133	—	—	2	—	—	—	1·52	—
Jamaica Company, Royal Artillery	3	—	3	—	—	..	..	—	—	—	—
Royal Engineers	61	..	61	—	—	..	..	—	—	..	..
2nd Leinster Regiment	281	29	252	—	—	3	1	—	—	1·19	·40
2nd West India Regiment	10	—	10	—	—	—	—	—	—	—	—
Depôt West India Regiment	6	—	6	—	—	—	—	—	—	—	—
Staff and Departments	28	1	27	—	—	—	—	—	—	..	—
Total	566	74	492	—	—	5	1	—	—	1·02	·20
CEYLON.											
37th Company, Southern Division, Royal Garrison Artillery ...	116	—	116	—	—	4	—	—	—	3·45	—
2nd King's Royal Rifle Corps	888	43	845	—	—	25	5	—	—	2·97	·59
Army Pay Corps	2	—	2	—	—	1	—	—	—	50·00	—
Total	1,006	43	963	—	—	30	5	—	—	3·11	·52

India.—Table No. 1.

Corps or Units. (Units which have no inoculated men are not shown.)	Average strength as shown in Annual Returns.	Actual number of men in the unit who have had preventive inoculation at any time during the year or in previous years.	Actual number of men who have not had preventive inoculation at any time during the year or in previous years.	Cases of Enteric Fever.				Percentage to Strength.			
				Amongst the men inoculated.		Amongst the men not inoculated.		Amongst the men inoculated.		Amongst the men not inoculated.	
				Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
4th Dragoon Guards	545	328	392	11	1	3	1	3·4	·30	2·3	·26
3rd Hussars	518	291	236	9	3	16	4	3·1	1·03	6·8	1·69
4th ,, ...	530	33	497	—	—	15	4	—	—	3·0	·80
9th Lancers	78	4	69	—	—	1	1	—	—	1·4	1·45
15th Hussars	454	321	57	1	1	9	5	·3	·31	15·8	8·77
20th ,, ...	556	51	549	1	—	16	3	2·0	—	2·9	·55
"D" Battery, Royal Horse Artillery	144	113	31	—	—	1	1	—	—	3·2	3·23
"E" ,, ,, ,, ,, ...	151	136	15	4	—	1	1	2·9	—	6·7	6·67
"F" ,, ,, ,, ,, ...	140	33	106	—	—	—	—	—	—	—	—
"H" ,, ,, ,, ,, ...	96	2	82	—	—	—	—	—	—	—	—
"K" ,, ,, ,, ,, ...	147	16	128	—	—	1	—	—	—	·8	—
1st ,, Royal Field Artillery	147	4	143	—	—	1	—	—	—	·7	—
3rd ,, ,, ,, ,, ...	129	18	104	—	—	—	—	—	—	—	—
6th ,, ,, ,, ,, ...	122	6	94	—	—	—	—	—	—	—	—
12th ,, ,, ,, ,, ...	68	21	123	—	—	—	—	—	—	—	—
15th ,, ,, ,, ,, ...	130	3	110	—	—	3	2	—	—	2·7	1·82
16th ,, ,, ,, ,, ...	133	4	129	—	—	4	—	—	—	3·1	—
22nd ,, ,, ,, ,, ...	131	10	121	—	—	6	—	—	—	5·0	—
23rd ,, ,, ,, ,, ...	121	7	114	—	—	6	4	—	—	5·3	3·51
25th ,, ,, ,, ,, ...	143	3	140	—	—	1	1	—	—	·7	·71
27th ,, ,, ,, ,, ...	117	49	81	2	—	1	—	4·1	—	1·2	—
29th ,, ,, ,, ,, ...	122	14	106	1	—	2	1	7·1	—	1·9	·95
30th ,, ,, ,, ,, ...	138	3	117	—	—	2	—	—	—	1·7	—
31st ,, ,, ,, ,, ...	149	3	146	—	—	—	—	—	—	—	—
32nd ,, ,, ,, ,, ...	134	11	131	—	—	—	—	—	—	—	—
33rd ,, ,, ,, ,, ...	146	7	139	—	—	—	—	—	—	—	—
35th ,, ,, ,, ,, ...	143	5	123	—	—	1	—	—	—	·8	—
40th ,, ,, ,, ,, ...	137	2	135	—	—	—	—	—	—	—	—
42nd ,, ,, ,, ,, ...	137	3	99	—	—	1	1	—	—	1·0	1·01

| | | |

Corps or Units. (Units which have no inoculated men are not shown.)	Average strength as shown in the Annual Returns.	Actual number of men in the unit who have had preventive inoculation at any time during the year or in previous years.	Actual number of men who have not had preventive inoculation at any time during the year or in previous years.	Cases of Enteric Fever.				Percentage to Strength.			
				Amongst the men inoculated.		Amongst the men not inoculated.		Amongst the men inoculated.		Amongst the men not inoculated.	
				Admissions.	Died.	Admissions.	Died.	Admissions.	Died.	Admissions.	Died.
1st Scottish Rifles	841	190	663	3	—	19	4	1·6	—	2·9	·60
2nd Royal Inniskilling Fusiliers	919	153	1,106	3	—	7	—	2·0	—	·6	—
2nd East Lancashire Regiment	958	43	1,318	—	—	10	2	—	—	·8	·15
1st East Surrey Regiment	797	12	769	—	—	12	3	—	—	1·6	·39
1st Duke of Cornwall's Light Infantry	814	11	91	—	—	2	1	—	—	2·2	1·10
2nd West Riding Regiment	844	304	528	—	—	4	2	—	—	·8	·38
2nd Border Regiment	924	51	1,151	—	—	3	1	—	—	·3	·09
2nd Royal Sussex Regiment	909	14	871	—	—	1	1	—	—	·3	·27
1st Hampshire Regiment	950	56	666	—	—	18	10	—	—	2·7	1·50
2nd South Staffordshire Regiment	1,019	116	1,072	1	—	31	10	·9	—	3·2	·93
1st Dorsetshire Regiment	1,011	68	589	—	—	16	5	—	—	2·7	·85
2nd South Lancashire Regiment	929	18	792	—	—	7	3	—	—	·9	·38
2nd Welsh Regiment	845	11	653	—	—	22	5	—	—	3·4	·77
1st Royal Highlanders	904	52	780	—	—	10	2	—	—	1·3	·26
2nd Oxfordshire Light Infantry	963	159	1,134	—	—	13	6	—	—	1·1	·53
1st Northamptonshire Regiment	810	34	681	—	—	8	2	—	—	1·2	·29
1st Middlesex Regiment	861	1	673	—	—	4	1	—	—	·6	·15
1st Wiltshire Regiment	1,087	57	1,039	1	—	55	12	1·8	—	5·3	1·15
1st North Staffordshire Regiment	1,126	337	752	3	1	18	7	·9	·30	2·4	·93
2nd York and Lancaster Regiment	997	308	689	1	—	11	3	·3	—	1·6	·44
2nd Connaught Rangers	1,000	21	555	—	—	1	—	—	—	·2	—
2nd Argyll and Sutherland Highlanders	863	9	811	—	—	9	1	—	—	1·1	·12
2nd Royal Munster Fusiliers	879	22	514	1	—	6	1	4·5	—	1·2	·19
3rd Rifle Brigade	888	213	731	—	—	15	2	—	—	2·1	·27
Men of various corps, and garrison staff and departments.	12,991	99	550	1	—	5	3	1·0	—	·9	·55
Total	60,553	5,999	38,824	52	8	731	224	·9	·13	1·9	·58

Table No. II.—Detailed statement of cases of Enteric Fever amongst men inoculated, 1900.

Corps.	Regimental No.	Rank and Name.	Date of inoculation.	If known, state nature and strength of inoculation material used.	Date of Attack.	Result: recovered or died.	Remarks.
3rd Hussars	4121	Private J. W. ..	3. 2. 99	Material supplied by Prof. Wright of Netley.	11. 1. 00	R.	
1st Scottish Rifles	5808	Private J. S. ..	„	„	20. 1. 00	R.	
3rd Hussars	3362	Private A. M. ..	„	„	20. 3. 00	R.	
„	4122	Lce.-Corp. J. B.	„	„	25. 3. 00	Died (13. 4. 00)	
„	3760	Lce.-Corp. T. C.	„	„	8. 4. 00	R.	
„	3427	Private K. W. ..	„	„	12. 4. 00	R.	
„	4110	Private A. W. ..	„	„	26. 4. 00	Died (1. 5. 00)	
„	3700	Private T. R. ..	„	„	27. 5. 00	Died (12. 7. 00)	
„	3999	Private E. F. ..	„	„	11. 8. 00	R.	
2nd Royal Munster Fusiliers ..	5457	Private J. D. ..	6. 3. 00	„	17. 8. 00	R.	
1st Scottish Rifles	5690	Private T. B. ..	3. 2. 99	„	10. 9. 00	R.	
1st Rifle Brigade	4239	Private J. C. ..	13. 4. 00	„	8. 11. 00	R.	
1st Scottish Rifles	5822	Lce.-Corp. K. C.	3. 2. 99	„	2. 12. 00	R.	
3rd Hussars	3945	Private J. H. ..	„	„	29. 12. 00	R.	
2nd York and Lancaster Regt...	4197	Private J. W. ..	11. 1. 99	Amount used ·75 c.c.	10. 11. 00	R.	Severe.
1st N. Staffordshire Regiment ..	5222	Private G. G. ..	28. 9. 99	Unknown.	17. 4. 00	Died (30. 4. 00)	Severe.
„ „ ..	4898	Private D. M. ..	17. 1. 99	„	29. 4. 00	R.	
„ „ ..	5662	Private J. B. ..	28. 9. 99	„	11. 11. 00	R.	
15th Hussars	3625	Private A. S. ..	8. 9. 99	„	26. 3. 00	Died (8. 4. 00)	

Corps.	Regimental No.	Rank and Name.	Date of Inoculation.	If known, state nature and strength of inoculation material used.	Date of Attack.	Result: recovered or died.	Remarks.
2nd S. Staffordshire Regiment..	5176	Private J. R. ..	7.3.00	5 p.c. typhoid vaccine.	31.3.00	R.	
2nd Royal Inniskilling Fusiliers	4524	Private J. McG.	27.8.00	Unknown.	20.9.00	R.	
,, ,,	4161	Private G. M. ..	,,	,,	3.12.00	R.	
,, ,,	5427	Private D. R. ..	,,	,,	11.12.00	R.	
4th Dragoon Guards	4011	Private B. ..	7.3.00	1 c.c. or 18 minims typhoid vaccine.	20.5.00	R.	Severe (2nd inoculation on 19.12.00).
,, ...	3505	Sergeant S. T. ..	,,	,,	5.6.00	R.	Mild.
,, ...	4862	Private G. McN.	,,	,,	20.6.00	R.	Severe.
,, ...	3932	Private G. ..	,,	,,	22.6.00	R.	Mild.
,, ...	4851	Private G. N. ..	,,	,,	23.6.00	R.	,,
,, ...	4737	Private S. D. ..	,,	,,	23.6.00	Died 6.8.00)	Severe hæmorrhage while convalescing.
,, ...	4510	Private W. K...	,,	,,	25.5.00	R.	Severe.
,, ...	4203	Private G. S. ..	,,	,,	1.7.00	R.	Mild.
,, ...	4883	Private B. H. ..	,,	,,	9.7.00	R.	,,
,, ...	4362	Private F. ..	,,	,,	5.10.00	R.	Severe.
1st Somerset Light Infantry ..	4227	Private J. K. ..	22.12.99	Unknown.	11.5.00	Died (27.5.00)	
,, ,, ..	4151	Private C. R. ..	,,	,,	31.7.00	R.	
,, ,, ..	4303	Private G. S. ..	,,	,,	12.7.00	R.	
,, ,, ..	4529	Lce.-Corp. F. H.	12.11.98	Professor Wright's serum.	21.5.00	R.	
4th Dragoon Guards	4202	Private W. H...	9.3.00	Dose 1 cc. or 18 minims.	5.6.00	R.	
3rd Company, Eastern Division, Royal Garrison Artillery.	10009	Gunner E. C. ..	22.2.00	,,	4.7.00	R.	
"E" Battery, Royal Horse Artillery.	15929	Gunner W. C...	2.9.99	Strength varied in each bottle used.	2.1.00	R.	
,, ,, ,,	15497	Driver C. S. ..	,,	,,	6.8.00	R.	
,, ,, ,,	33796	Driver J. W. ..	20.9.00		18.9.00	R.	

29th Battery, Royal Field Artillery.	40015	Qr M.S. C.L. ..	23.3.99	,,	30.9.00	R.		
"E" Battery, Royal Horse Artillery.	18961	Driver J.S. ..	13.9.00	,,	8.10.00	R.		
20th Hussars	4456	Private H.G.C.	16.8.99	Dose ·75 c.c.	24.9.00	R.		
1st Royal Fusiliers	6380	Private T.R. ..	20.3.00	Unknown.	2.4.00	Died (12.4.00)		
1st Royal Fusiliers	4204	Private F.B. ..	1.4.00	Unknown.	19.9.00	R.	Mild.	
27th Company, Royal Field Artillery.	5790	Gunner W.L. ..	26.2.00	No. 10 from Pathological Department, Netley.	13.3.00	R.		First inoculated at Netley on 28.6.99.
,,	20269	Gunner G.D. ..	,,	2·5 c.c.	1.9.00	R.		
1st Wiltshire Regiment.. ..	4803	Private A.B. ..	27.3.00	Unknown.	10.9.00	R.		
2nd Suffolk Regiment	3681	Private G.E.D.	19.4.00	,,	14.9.00	R.		
25th Company, Western Division, Royal Garrison Artillery.	22947	Gunner P. McI.	18.4.00	,,	21.9.00	R.		

Table No. 3.—Recompilation Table—referred to in paragraph 6 of attached report.

Corps.	*a* No. as per inoculation tables of 1899.	*b* No. as per nominal rolls of 1900.	*c* Total of Columns 1 and 2.	*d* No. as per inoculation tables of 1900.	*e* Discrepancy between columns 3 and 4.	Remarks.
Cavalry.						
4th Dragoon Guards	28	310	338	328	-10	
3rd Hussars	374	1	375	291	-84	
4th ,, ...	80	11	91	33	-58	
9th Lancers	...	4	4	4	...	
15th Hussars	355	51	406	321	-85	
20th ,, ...	80	...	80	81	+1	
16th Lancers	...	1	1	1	...	
Royal Artillery.						
"D" Royal Horse Artillery...	106	8	113	113	...	
"E" ,, ,, ,, ...	...	4	4	136	+132	Probably inoculated in England.
"F" ,, ,, ,, ...	...	36	36	36	...	
"H" ,, ,, ,, ...	19	...	19	2	-17	
"I" ,, ,, ,, ...	...	1	1	1	...	
"K" ,, ,, ,, ...	16	...	16	16	...	
1st Royal Field Artillery ...	2	...	2	4	+2	
3rd ,, ,, ,, ...	21	1	22	18	-4	
6th ,, ,, ,, ...	...	6	6	6	...	
12th ,, ,, ,, ...	...	21	21	21	...	
15th ,, ,, ,, ...	10	...	10	3	-7	
16th ,, ,, ,, ...	2	...	2	4	+2	
22nd ,, ,, ,, ...	9	...	9	10	+1	
23rd ,, ,, ,, ...	..	7	7	7	...	
24th ,, ,, ,, ...	...	4	4	4	...	
25th ,, ,, ,, ...	3	...	3	3	...	
27th ,, ,, ,, ...	...	47	47	49	+2	
29th ,, ,, ,, ...	7	...	7	14	+7	
30th ,, ,, ,, ...	...	3	3	3	...	
31st ,, ,, ,, ...	...	3	3	3	...	
32nd ,, ,, ,, ...	15	1	16	11	-5	
33rd ,, ,, ,, ...	...	7	7	7	...	
35th ,, ,, ,, ...	...	5	5	5	...	
40th ,, ,, ,, ...	13	2	15	2*	-13	
41st ,, ,, ,, ...	...	2	2	2	...	
45th ,, ,, ,, ...	...	3	3	3	...	
47th ,, ,, ,, ...	...	19	19	19	...	
50th ,, ,, ,, ...	8	1	9	9	...	
51st ,, ,, ,, ...	...	1	1	1	...	
52nd ,, ,, ,, ...	...	6	6	7	+1	
54th ,, ,, ,, ...	27	1	28	13	-15	
55th ,, ,, ,, ...	...	9	9	9	...	
57th ,, ,, ,, ...	...	17	17	17	...	
70th ,, ,, ,, ...	...	6	6	6	...	
80th ,, ,, ,, ...	...	17	17	17	...	
No. 1 Mountain Div. R.G.A.	23	...	23	39	+16	
No. 2 ,, ,, ,, ...	13	...	13	21	+8	
No. 3 ,, ,, ,, ...	...	...	...	1	+1	
No. 5 ,, ,, ,, ...	11	8	19	24	+5	
No. 6 ,, ,, ,, ...	31	5	36	25	-11	
1st Co. Eastern Div. R.G.A.	..	9	9	9	...	
3rd ,, ,, ,, ,, ...	...	...	...	8	+8	
4th ,, ,, ,, ,, ...	...	12	12	12	...	
7th ,, ,, ,, ,, ...	...	1	1	1	...	
9th ,, ,, ,, ,, ...	...	7	7	7	...	
13th ,, ,, ,, ,, ...	..	1	1	1	...	
24th ,, ,, ,, ,, ...	.	3	3	4	+1	
26th ,, ,, ,, ,, ...	...	6	6	6	...	
5th Co. Southern Div. R.G.A.	12	1	13	13	...	
6th ,, ,, ,, ,, ...	..	4	4	4	...	
9th ,, ,, ,, ,, ...	...	4	4	4	...	
11th ,, ,, ,, ,, ...	...	1	1	1	...	
29th ,, ,, ,, ,, ...	...	2	2	2	...	
33rd ,, ,, ,, ,, ...	27	4	31	31	...	
4th Co. Western Div. R.G.A.	...	2	2	2	...	
7th ,, ,, ,, ,, ...	8	...	8	6	-2	
18th ,, ,, ,, ,, ...	1	6	7	6	-1	
22nd ,, ,, ,, ,, ...	...	...	...	4	+4	
26th ,, ,, ,, ,, ...	..	12	12	12	...	

* Apparently these figures exclude men inoculated in previous years, which is not correct.

Corps.	*a* No. as per inoculation tables of 1899.	*b* No. as per nominal rolls of 1900.	*c* Total of Columns 1 and 2.	*d* No. as per inoculation tables of 1900.	*e* Discrepancy between columns 3 and 4.	Remarks.
Infantry.						
1st Royal West Surrey Regiment.	208	...	208	208	...	
2nd Royal Scots	198	15	213	184	−29	
1st Royal Warwick Regiment.	26	33	59	33*	−26	
1st Royal Fusiliers	...	59	59	67	+8	
1st Norfolk Regiment ...	50	55	105	65	−40	
1st Lincolnshire Regiment ...	35	47	82	82	...	
2nd Suffolk Regiment ...	42	10	52	10*	−42	
1st Somerset Light Infantry.	341	97	438	438	...	
1st West Yorkshire Regiment.	...	216	216	295	+79	
1st East Yorkshire Regiment.	...	75	75	75	...	
1st Bedfordshire Regiment ...	...	33	33	33	...	
2nd Royal Irish Regiment ...	26	2	28	28	...	
2nd Yorkshire Regiment ...	165	37	202	214	+12	
1st Royal Scots Fusiliers ...	...	10	10	10	...	
1st Cheshire Regiment ...	37	28	65	65	...	
1st South Wales Borderers ...	52	14	66	14*	−52	
2nd King's Own Scottish Borderers.	4	15	19	11	−8	
1st Scottish Rifles	217	17	234	190	−44	
2nd Royal Inniskilling Fusiliers.	...	3	3	153	+150	
2nd East Lancashire Regiment.	...	42	42	43	+1	
1st East Surrey Regiment ...	8	...	8	12	+4	
1st Duke of Cornwall's Light Infantry.	11	3	14	11	−3	
2nd West Riding Regiment ...	284†	5	289	304	+15	† Including 232 men inoculated in 1898 and omitted from the return of 1899.
2nd Border Regiment ...	...	51	51	51	...	
2nd Royal Sussex Regiment ...	...	11	11	11	...	
1st Hampshire Regiment ...	78	36	114	36*	−78	
2nd South Staffordshire Regiment.	...	116	116	116	...	
1st Dorsetshire Regiment ...	...	68	68	68	...	
2nd South Lancashire Regiment.	...	19	19	18	−1	
2nd Welsh Regiment	14	...	14	14	...	
1st Royal Highlanders ...	53	44	97	52	−45	
2nd Oxfordshire Light Infantry.	...	62	62	159	+97	
1st Northamptonshire Regiment.	7	34	41	34*	−7	
1st Middlesex Regiment ..	13	4	17	4*	−13	
1st Wiltshire Regiment ...	86	57	143	57*	−86	
1st North Staffordshire Regiment.	318	31	349	337	−12	
2nd York and Lancaster Regiment.	171	146	317	308	−9	
2nd Durham Light Infantry.	...	4	4	4	...	
1st Royal Irish Rifles	...	6	6	7	+1	
2nd Connaught Rangers ...	23	2	25	21	−4	
2nd Argyll and Sutherland Highlanders.	...	9	9	9	...	
2nd Royal Munster Fusiliers	...	22	22	22	...	
3rd Rifle Brigade	213	...	213	213	...	
Various Corps	86	4	90	60	−30	
Totals	4,076	2,246	6,282	5,999	−283	

* Apparently these figures exclude men inoculated in previous years.

Table No. 4.—Detailed statement of cases of Enteric Fever amongst the 2,246 men inoculated during 1900 (compiled from nominal rolls).

Corps.	Regimental No.	Rank and Name.	Date of inoculation.	Date of attack.	Interval between dates of inoculation and attack.	Result.	Remarks.
					days.		
2 d Royal Munster Fusiliers ..	5,157	Private J. D. ..	6.3.00	17.8.00	164	Recovered.	
2nd S Staffordshire Regiment	5.176	Private J. R. ..	7.3.00	31.3.00	24	,,	
4th Dragoon Guards	4,011	Private B... ..	7.3.00	20.5.00	74	,,	Second inoculation on 1.9.12.00.
,, ,, ...	3,505	Sergeant S. T. ..	7.3.00	5.6.00	90	,,	
,, ,, ...	4.862	Private G. McN...	7.3.00	20.6.00	105	,,	
,, ,, ..	3 932	Private G. ..	7.3.00	22.6.00	107	,,	
,, ,, ...	4.851	Private G. N. ..	7.3.00	23.6.00	108	,,	
,, ,, ...	4 737	Private S. D. ..	7.3.00	23.6.00	108	Died.	
,, ,, ...	4,510	Private W. K. ..	7.3.00	25.5.00	79	Recovered.	
,, ,, ...	4,2?3	Private G. S. ..	7.3.00	1.7.00	116	,,	
,, ,, ...	4 883	Private B. H. ..	7.3.00	9.7.00	124	,,	
,, ,, ...	4,362	Private F... ..	7.3.00	5.10.00	212	,,	
,, ,, ...	4.202	Private W. H. ..	9.3.00	5.6.00	88	,,	
3rd Co., Eastern Division, R.G.A.	10,009	Gunner E. C. ..	22.2.00	4.7.00	132	,,	
1st Royal Fusiliers	6,389	Private T. R. ..	20.3.00	2.4.00	13	Died.	
,, ,, ...	4,204	Private F. B. ..	1.4.00	19.9.00	171	Recovered.	
27th Co., R.F.A.	8,790	Gunner W. L. ..	26.2.00	13.3.00	15	,,	
,, ...	20,269	Gunner G. D. ..	26.2.00	1.9.00	187	,,	
1st Wiltshire Regiment ..	4,803	Private A. B. ..	27.3.00	10.9.00	167	,,	First inoculated at Netley on 28th June, 1899.
2nd Suffolk Regiment . ..	3,681	Private G. E. D. ..	19 4.00	14.9.00	148	,,	
25th Co., Western Division, R.G.A.	22,947	Gunner P. McI. ..	18.4.00	21.9.00	156	,,	

REMARKS.

In dealing with the figures connected with inoculations against enteric fever in India, the Principal Medical Officer submits the following observations showing the difficulty experienced in the endeavour to compile complete and reliable statistics:—

1. Notwithstanding the changes made in the original form by omitting column 2, showing the strength, and altering the heading of column 3 of the enteric inoculation table, many instances of failure to obtain correct figures have happened. For example, the total strength of a corps, as calculated from columns 2 and 3 of the revised form, is in some cases not only considerably in excess of, but in others much lower than, that shown in the annual returns.

2. At first sight, it would appear as if it ought to be quite a simple matter to count up the number of inoculated and of non-inoculated men among the troops during any one year. But experience shows that it is often very difficult to obtain exact figures, especially those connected with the calculation of the actual number of the non-inoculated men for the year. In the table furnished for 1899, the figures indicating the number of non-inoculated men were obtained by subtracting the actual number of inoculated men from the annual average strength of the corps, a procedure which must obviously yield inaccurate figures.

3. The difficulties met with in obtaining accurate actuals are brought about by the movements of troops, and chiefly in the following ways:—

(*a*) All corps are constantly liable to changes in strength from many other causes than men arriving during the year; as, for instance, by a corps having detachments in several stations, by men having to be detached from time to time for duties away from the corps, and by casualties such as deaths, invaliding and men going home time expired, &c. Such changes mean difficulty in keeping up accurate returns of inoculated and non-inoculated men by stations.

(*b*) The number of inoculated men shown in the returns is, as a matter of course, always an actual, whereas, owing to the numerous causes which lead to changes in strength, it is extremely difficult to get at the actual number of the non-inoculated men, and, in many instances, the figures supplied have apparently again been calculated from the average strength of the corps for the year.

(*c*) As the result of changes of station, it has been found that the same inoculated men are sometimes shown in returns from more than one station, that is to say, the same men are counted in twice, or, it may be, even three times over. In the same way, on the other hand, inoculated men may sometimes be lost sight of altogether. The same remarks are of course equally true of the non-inoculated men.

(*d*) The number of men inoculated in India can be accurately checked from the nominal rolls furnished with the numerical returns, but there is no such means of checking the figures relating to men who have been inoculated in England or elsewhere out of India.

4. The revised return asks for the actual number of men in the unit who have had preventive inoculations at any time during the year or in previous years. It is stated from the following stations that details of the inoculations performed in previous years are not available—Dum Dum, Lucknow, Pachmarhi, Solon, Kirkee, Purandhur and Deolali.

In one or two other instances, only the men inoculated during 1900 were shown, but on referring to the previous year's returns, relating to the corps concerned, it was observed that the inoculations for 1899 had been omitted.

5. These facts were ascertained during a recompilation from the revised and other returns in an attempt to get at complete statistics.

6. The recompilation was made in the following way :—

A table (No. 3) was prepared with columns to show :—

(*a*) The number of men inoculated in previous years (obtained from last year's and other returns).
(*b*) The number of men inoculated in 1900 (obtained from the nominal rolls for the year).
(*c*) The total number of inoculated men (obtained as above).
(*d*) The total number of inoculated men as given in the returns from stations for 1900.
(*e*) The discrepancies observed.

The results obtained were :—

Year.	Number of men inoculated.
1898	232
1899	3,804
1900	2,246
	6,282

The total number of men inoculated during the year and in previous years, as shown in the returns from stations for 1900, was 5,999, leaving 283 men unaccounted for.

There may have been more men inoculated in 1898. The figures (232) are taken from the Rangoon Annual Report of Medical Transactions, and refer only to one regiment.

The figures for 1899 are not absolutely trustworthy, as they are liable to error in the ways referred to in paragraph 4, and there is now no possibility of checking them.

7. For the reasons just advanced, the total number of 5,999 men (compiled from the numerical returns for 1900) cannot be accepted as being an accurate statement of the total number of inoculated men serving in India during the year; while, as already pointed out, the figures representing the numbers of non-inoculated men in units are likely to be much more inaccurate and unreliable, and it is impossible in many instances to use the figures given for the purpose of calculating reliable comparative percentages or ratios. It may be here mentioned that the returns for 1900 show that during the year 52 admissions for enteric fever with 8 deaths occurred among the inoculated men.

8. On the other hand, the 2,246 inoculations shown for 1900 is a reliable number, as the figures are compiled from nominal rolls which have been carefully compared and checked. These figures refer only to men inoculated in India during the year. The number does not include men arriving in the country who had been inoculated elsewhere, as there is no means available for verifying the figures relating to such men. It follows that the statistics connected with these 2,246 men are the only ones this year of any value for forming an inference as to the effect of preventive inoculations, and the number is sufficiently large to make the evidence of some value, based as it is on accurate statistics, and the more reliable because, owing to stoppage of the ordinary reliefs, the men must have been in the country throughout the year.

Of the 2,246 men inoculated in 1900, 21 were subsequently admitted for enteric fever, and two of the men died, giving an admission ratio of 9·3 and a mortality ratio of ·89 per 1,000. If we compare these ratios with the general admission and mortality ratios for enteric fever for the year, we find that they tell greatly in favour of inoculation. Thus, with an average strength of 60,553 European troops in India during 1900, there were 970 admissions with 289 deaths, giving admission and mortality ratios of 16·0 and 4·77 per 1,000 respectively. In making this comparison, it must be pointed out that we are comparing the incidence of the disease among an actual number (of inoculated men) with its incidence among an average number; and further, the average number does not solely represent non-inoculated men, but it also includes all the inoculated men serving in India whether the inoculations were performed during the year or in previous

years. This lessens the value of the comparison, but it does not alter the fact of the comparatively small incidence of the disease among the men inoculated in 1900.

9. In Table No. 2 a detailed statement of the 21 cases of enteric fever is given, and the table has a column in which is shown the interval that elapsed between the dates of inoculation and attack. It will be observed that the shortest interval was 13 days and the longest 212 days.

10. It is pointed out that no account is taken of the period at which the inoculations are performed, all the inoculations being reckoned of the same value as far as statistics are concerned, whether they are done in the beginning of the year or shortly before its end. It would seem that the element of time must be taken into account as well as those of men and place, and that it is not proper to count a man present for one day in a station equal to a man present for 365. A truer value would apparently be given to the figures if an average instead of an actual strength of inoculated men were taken, while, at the same time, it would permit of two averages being used in making comparisons—

Average strength of inoculated men.	Average strength of non-inoculated men.
Number of admissions and deaths from enteric fever.	Number of admissions and deaths from enteric fever.

11. Averages instead of actuals would no doubt give more approximately true results, as the value of the "time" factor would be more correctly rendered. Given the average strength of the inoculated men, the average strength of the non-inoculated men would be readily obtained by subtracting the inoculated average strength from the annual average strength of the corps. But, to obtain the first average strength will entail a considerable amount of clerical labour, and I fear that it will be found difficult to carry out the idea in practice.

12. In some instances it would appear that the figures shown in the present returns as the *actual* number of non-inoculated men are obtained by subtracting the *actual* number of inoculated men from the annual *average* strength of the corps (see also paragraphs 2 and 3*b*). Such a number is neither an actual nor an average, and the percentage to strength of enteric admissions and deaths calculated from it can be of no real value for purposes of comparison with a percentage to strength calculated from an actual number of inoculated men.

13. A table showing the inoculation statistics by corps on similar lines to that furnished for 1899 has been prepared (Table No. 1),* but taking into consideration the possible sources of error indicated in the preceding paragraphs, would the figures be of any value for estimating the results of preventive inoculation?

14. The question next arises as to the plan to be followed in preparing the inoculation returns for 1901. It seems to me to be the sounder method to accept limited but accurate evidence (such as is given in paragraph 8) prepared from nominal rolls, rather than to place reliance on more elaborate statistics obtained from returns showing only figures, which are always difficult and often impossible to check.

In succeeding years, when ordinary reliefs are re-established, an average instead of an actual strength will be required to give each man shown in the nominal roll his true value in connection with the formation of accurate percentages or ratios: (1) Whether he has been in India throughout the year or only during part of it; (2) the proportion of the year during which

* A column showing the average annual strength of corps has been added, for contrasting with the figures given as the actual numbers of inoculated and non-inoculated men.

he has been protected by inoculation. Such an average strength could be calculated from a nominal roll giving data as under :—

Corps.	No.	Rank and name.	Date of arrival in India.	Date of first inoculation.	Date of second inoculation.	Date of becoming non-effective through death or leaving India.

Columns to be added to show the cases of enteric occurring amongst inoculated men, thus :—

Cases of enteric fever amongst the inoculated men.			Remarks.
Date of attack.	Interval between dates of inoculation and attack.	Result.	
	days.		

Notes.—In the returns received from Home Stations, it is shown that 107 men were inoculated, but as the men afterwards apparently all proceeded abroad, it is not possible to give any incidence of enteric in connection therewith for the United Kingdom.

No inoculations against enteric fever were carried out in the Gibraltar, Malta, Canada, Bermuda, Barbados, Western Africa, Mauritius, China, or Straits Settlements Commands.

Other returns received show that, amongst troops proceeding abroad, mainly to South Africa, 4,739 individuals were inoculated on board ship, and the incidence of enteric fever in connection with these will, no doubt, be forthcoming in returns to be furnished after the close of the campaign.

APPENDICES XI–XIII.

APPENI

Annual Abstract of Meteorological Observations tak

NETLEY. Lat. 50° 51' N

Month.	Mean Pressure—Corrected and reduced to 32° Fahrenheit.	Air Temperature. Mean at 9 a.m.	Mean daily.	Means of Min.	Means of Max.	Abs. Min. Temp.	Abs. Min. Day.	Abs. Max. Temp.	Abs. Max. Day.	Tension of Vapour.	Per cent. Mean.	Per cent.
January ...	29·841	41·1	40·9	34·3	47·5	23·2	6	55·2	24	·254	86	
February...	29·465	37·6	38·5	31·5	45·6	18·2	10	66·0	26	·224	84	
March ...	29·897	39·1	40·5	31·9	49·2	20·2	18	60·0	12	·228	78	
April ...	29·904	48·8	48·7	37·0	60·5	24·3	2	78·6	22	·335	76	
May ...	29·862	53·1	53·5	41·5	65·5	33·1	16	75·2	28	·379	72	
June ...	29·335	60·2	61·5	49·1	74·0	43·7	6	85·4	12	·474	72	
July ...	29·913	66·3	67·0	54·0	80·1	41·3	8	94·0	25	·569	69	
August ...	29·866	62·1	63·6	51·8	75·4	46·2	25	89·0	18	·514	72	
September	30·031	59·5	59·7	45·7	73·8	36·0	26	88·9	23	·477	72	
October ...	29·890	51·2	51·9	42·6	61·3	26·5	22	69·0	8	·366	80	
November	29·649	45·7	49·1	39·5	58·8	27·0	23	66·0	10	·312	83	
December	29·849	44·8	46·3	39·2	53·5	28·0	22	63·8	24	·300	87	
Year ...	29·792	50·8	51·8	41·5	62·1	18·2	10th Feb.	94·0	25th July.	·369	76	

GIBRALTAR. Lat. 36° 6' 20" N

January ...	30·055	49·8	55·6	47·9	63·4	41·6	30	69·8	24	·321	73	
February...	29·875	54·7	58·4	51·8	65·0	47·4	5	72·4	16	·379	75	
March ...	29·861	54·0	56·1	50·3	61·9	44·6	18	68·2	12	·342	71	
April ...	30·007	58·9	61·4	55·3	67·5	45·4	6	76·0	12	·388	66	
May ...	29·899	62·7	64·1	57·5	70·8	51·0	10, 19	81·0	31	·436	66	
June ...	29·936	69·2	71·9	63·9	79·9	56·8	4	97·0	20	·508	58	
July ...	29·933	71·6	74·5	67·3	81·7	59·6	7	90·0	7	·567	61	
August ...	29·909	71·7	74·4	67·5	81·3	60·2	27	88·0	2	·582	63	
September	29·946	70·1	70·8	66·9	74·8	60·2	14	85·8	19	·604	72	
October ...	29·975	64·9	67·9	61·8	74·0	44·0	23	81·0	14	·525	74	
November	29·958	55·7	58·3	52·9	63·7	45·8	29	75·8	3	·382	73	
December	30·196	54·4	58·1	52·0	64·2	44·6	4	73·2	6	·362	75	
Year ...	29·962	61·5	64·3	57·9	70·7	41·6	30th Jan.	97·0	20th June.	·450	69	

MALTA. Lat. 35° 53' 49"

January ...	29·786	54·8	57·3	53·3	61·4	43·4	13, 14	67·2	6	·342	69	
February...	29·802	57·0	58·9	54·5	63·3	48·8	11	72·8	15	·371	70	
March ...	29·827	55·2	57·0	52·9	61·1	46·6	16	70·2	29	·352	71	
April ...	29·829	58·0	59·3	55·2	63·4	49·6	8	71·4	27	·375	69	
May ...	29·797	64·0	65·7	61·4	70·0	57·4	7	75·6	15	·466	69	
June ...	29·864	70·7	72·7	67·7	77·7	60·8	5	90·6	28	·579	67	
July ...	29·873	73·9	76·5	72·0	81·0	65·0	12	88·6	30	·655	68	
August ...	29·853	75·1	77·8	73·5	82·2	69·6	17	87·6	1	·678	65	
September	30·023	75·1	76·4	72·6	80·3	70·2	26, 27	87·8	11	·708	73	
October ...	30·005	73·1	76·1	71·6	80·7	65·8	10	89·0	24	·610	65	
November	29·846	67·6	66·2	62·3	70·2	54·8	13	77·2	4	·457	67	
December	30·007	56·7	58·8	55·3	62·4	51·4	1	65·0	7	·365	71	
Year ...	29·876	64·8	66·9	62·7	71·1	43·4	13th 14th Jan	90·6	28th June.	·496	69	

No. XI.

at Netley and Stations Abroad in the Year 1900.

Long. 1° 20′ W. Height of Barometer Cistern above Sea, 47 feet.

Mean Amount of Cloudiness.	Rainfall. Total.	Max.	Day.	Weather. No. of days of Rain.	Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	Wind. No. of Observations under each Point per Month. N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
7·8	4·32	1·39	6	18	—	—	—	—	1	18	8	2	10	3	3	5	20	5	13	1
8·0	7·14	1·12	15	17	4	—	—	1	2	17	6	7	18	—	5	3	14	3	5	1
8·0	1·60	·53	19	8	1	1	—	1	—	20	5	16	27	2	5	—	—	—	7	5
6·3	1·65	·53	3	10	—	—	1	—	—	13	6	4	8	2	10	1	17	3	12	3
6·9	2·12	·58	22	10	—	—	—	—	—	8	8	1	21	3	5	13	11	2	5	1
7·0	3·45	·72	22	16	—	1	3	—	1	9	4	2	8	—	6	1	25	6	10	2
5·7	1·64	·49	27	9	—	—	4	—	3	5	1	—	—	2	10	2	25	3	13	7
6·1	3·81	·62	6	15	—	—	—	—	2	11	8	—	18	—	4	3	26	3	4	4
5·2	1·43	·52	30	5	—	—	—	1	3	6	1	—	9	1	5	3	19	3	6	14
7·1	3·29	·72	29	12	—	—	1	1	—	13	6	4	4	1	—	4	22	7	12	8
7·7	4·03	·59	28	18	—	—	—	—	—	16	5	4	12	1	5	8	9	4	8	9
8·5	4·53	·96	30	23	—	—	—	3	—	21	10	2	6	2	5	8	26	7	3	3
7·0	39·01	1·39	6th Jan.	161	5	2	9	8	12	157	68	42	141	17	63	51	214	46	98	58

Long. 5° 20′ 53″ W. Height of Barometer Cistern above Sea, 52 feet

2·5	2·84	1·16	4	6	—	—	—	—	18	3	—	—	—	13	—	1	5	13	20	—
6·5	6·14	2·13	6	15	—	—	—	—	3	10	1	—	1	10	2	1	7	16	19	—
6·0	8·88	2·37	24	12	—	—	—	—	4	12	3	—	2	21	—	—	7	9	17	3
4·0	·63	·29	4	7	—	1	1	—	9	4	—	—	—	23	—	—	2	10	14	2
4·0	4·39	1·70	13	11	—	—	—	—	14	7	—	—	1	14	—	—	9	31	6	1
2·5	·05	·05	1	1	—	—	—	—	18	3	—	—	1	21	1	—	8	28	1	—
1·0	—	—	—	—	—	—	—	—	26	1	—	—	—	44	—	—	3	7	—	8
1·8	·37	·23	25	2	—	—	—	—	18	—	—	—	3	25	—	—	12	17	4	2
5·5	4·71	2·60	16	10	—	—	3	—	4	8	—	—	2	34	1	—	2	13	1	7
5·0	3·83	2·26	20	9	—	—	—	—	10	12	—	—	2	25	—	1	4	21	4	5
5·0	1·80	·48	27	13	—	—	—	—	5	9	—	1	—	5	1	—	4	16	30	3
5·0	·37	·18	15	5	—	—	—	—	10	4	—	—	—	28	2	—	5	9	18	—
4·1	34·01	2·60	16th Sept.	91	—	1	4	—	139	73	4	1	12	266	7	3	68	199	150	31

Long. 14° 30′ 54″ E. Height of Barometer Cistern above Sea, 112 feet.

4·5	5·24	1·16	13	15	—	5	6	—	5	2	5	6	2	—	6	4	12	13	19	—
4·5	·80	·24	11	10	—	—	—	—	2	1	1	2	—	—	8	1	13	12	20	—
5·5	·90	·32	25	8	—	—	1	—	3	4	1	1	3	2	17	4	9	—	26	—
5·0	2·09	·93	7	11	—	1	2	—	1	6	1	1	15	1	6	2	4	—	31	—
3·5	·66	·29	28	3	—	—	1	—	10	2	—	2	17	—	10	—	3	—	30	—
3·0	·35	·18	5	4	—	—	—	—	15	1	—	1	21	—	7	1	5	—	25	—
1·5	—	—	—	—	—	—	—	—	24	—	—	4	31	1	3	1	4	1	17	—
2·0	·03	·03	20	1	—	—	—	—	21	—	—	5	14	1	26	—	4	—	18	—
3·5	·04	·04	16	1	—	—	—	—	7	—	—	—	17	—	25	5	5	—	8	—
3·0	·69	·67	9	3	—	—	1	—	11	1	—	3	14	2	11	2	9	—	19	2
5·0	3·89	1·01	12	15	—	1	3	—	5	3	3	3	1	—	7	3	16	2	24	4
4·5	1·26	·53	25	13	—	1	1	—	3	1	1	10	12	4	4	—	3	1	23	5
3·8	15·95	1·16	13th Jan.	84	—	8	15	—	107	21	12	38	147	11	124	23	87	59	260	11

Appe

Annual Abstract of Meteorological Observations ta

SCUTARI CEMETERY. Lat. 41° 0′ 0″ N.

Month	Mean Pressure—Corrected and reduced to 32° Fahrenheit.	Air Temperature.								Tension of Vapour.	Relative Humidity	
		Mean at 9 a.m.	Mean daily.	Means of		Abs. Min.		Abs. Max.			Per cent.	Mi
				Min.	Max.	Temp.	Day.	Temp.	Day.		Mean.	Per cent.
January ...	29·920	42·9	44·8	40·2	49·5	30·8	24	63·8	30	·246	81	55
February ...	29·802	44·8	47·4	41·6	53·3	32·6	28	64·6	11	·274	81	56
March ...	29·843	43·2	45·2	38·6	51·8	26·2	10	72·0	29	·240	74	47
April ...	29·866	52·1	54·4	45·7	63·2	35·8	13	71·6	18	·325	72	45
May ...	29·814	59·8	62·1	52·5	71·7	45·4	1	85·4	16	·405	68	38
June ...	29·833	67·7	71·3	60·9	81·8	56·0	3, 4	92·4	23	·510	61	32
July ...	29·771	72·8	77·8*	66·4	89·2	62·2	12	96·4	28	·565	55	33
August ...	29·772	73·2	77·3	67·2	87·4	62·6	2	94·4	11	·502	58	36
September	29·997	64·4	67·5	58·1	77·0	52·6	16	84·6	9	·439	60	41
October ...	29·979	62·0	64·3	56·1	72·6	43·2	26	80·4	5	·441	67	45
November	29·955	53·6	56·8	50·5	64·1	44·4	2	67·4	5	·337	70	50
December	29·957	46·4	48·7	43·7	53·7	33·6	27	68·6	8	·282	78	54
Year ...	29·876	56·9	59·8	51·8	67·9	26·2	10th Mar.	96·4	28th July.	·388	69	32

* Custodian of cemetery reports this as being 1·6 above the average of 30 years, 1866 to 1895.

POLYMEDIA, CYPRUS. Lat. 34° 42½′ N.

January ...	29·511	55·3	56·1	46·5	65·7	43·5	24	72·9	9	·377	73	50
February ...	29·320	56·6	58·0	47·6	68·5	43·7	16	73·7	1	·391	73	47
March ...	29·387	58·6	58·7	47·2	70·3	38·4	16	83·1	26	·418	68	42
April ...	29·404	67·2	66·3	52·8	79·8	44·3	17	93·0	24	·492	60	35
*May ...	29·310	75·6	73·6	59·6	87·7	53·5	8	97·2	5	·658	63	40
June ...												
July ...												
August ...												
†September	29·403	76·1	77·7	63·4	92·0	58·1	24	99·2	20	·584	47	33
October ...	29·439	76·2	78·4	66·1	90·7	55·8	15	98·4	6	·627	55	35
November	29·446	65·5	68·8	55·4	82·3	51·5	27	87·7	8	·461	60	34
December	29·424	57·5	60·0	50·1	69·9	43·9	26	76·9	5	·374	67	40

* To 29th May, inclu ive. Instruments removed to Mount Troodos. † From 15th September, inclusive

MOUNT TROODOS, CYPRUS. Lat. 34° 54′ N.

January ...												
February ...												
March ...												
April ...												
May ...	Aneroid											
*June ...	24·12	60·8	67·0	53·9	80·1	42·7	15	87·3	21	·348	49	31
July ...	†	65·0	70·3	57·5	83·1	51·3	18	91·3	29	·409	51	31
August ...	†	65·1	70·5	56·3	84·7	51·5	27	90·9	16	·371	45	31
‡September	24·12	61·3	67·0	53·2	80·8	47·1	1	85·1	1	·372	52	47
October ...												
November												
December												

* From 6th June inclusive. † Aneroid barometer fell below 24° and could not be re
‡ To 9th September, inclusive. Instruments taken down for conveyance to Polymedia.

ntinued.

d Stations Abroad in the year 1900.

3′ 0″ E. Height of Barometer Cistern above Sea, 60 feet.

	Weather.								Wind.								
		No. of days of							No. of Observations under each Point per Month.								
	Day.	Rain.	Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
5	22	19	2	—	—	8	—	17	—	7	19	2	4	8	8	2	3	9
7	22	17	—	—	—	4	—	17	—	6	17	2	3	7	6	2	1	12
8	3	15	3	1	—	3	2	16	—	3	17	8	3	5	14	1	1	10
0	10	11	—	—	2	2	8	8	—	5	18	3	2	13	8	2	—	9
5	18	10	—	—	3	—	7	8	—	5	23	6	1	8	10	—	—	9
3	13	9	—	—	1	1	11	2	—	2	21	3	1	11	14	—	—	8
1	15	1	—	—	—	1	15	—	—	4	36	6	—	8	7	—	—	1
5	1	2	—	—	3	4	11	2	—	4	35	6	1	1	11	1	2	1
4	11	4	—	—	—	—	9	2	—	3	38	7	—	4	4	1	—	3
3	16	6	—	—	2	1	12	4	—	5	20	2	3	5	14	4	1	8
5	12	10	—	—	1	—	2	5	—	2	22	11	5	3	2	1	—	14
1	3	17	—	1	1	2	6	15	1	5	23	4	4	5	9	—	2	10
1	3rd Dec.	121	5	2	13	26	83	96	1	51	289	60	27	78	107	14	10	94

0° 1′ E. Height of Barometer Cistern above Sea, 460 feet.

5	22	14	—	—	2	—	1	4	4	1	6	4	—	2	—	3	46	—
5	23	16	—	—	6	—	—	2	1	13	3	12	4	—	1	5	16	2
5	15	11	—	—	3	—	—	1	4	4	5	1	4	4	4	13	26	1
5	25	4	—	—	1	—	2	2	3	2	—	7	5	1	5	21	18	1
5	6	4	—	—	2	—	—	—	2	—	2	2	1	5	10	26	12	—
	—	—	—	—	3	—	3	—	1	—	—	—	2	—	8	15	7	—
5	14	3	—	—	2	—	7	1	—	7	5	4	10	3	8	6	16	3
5	26	8	—	—	4	—	17	4	—	1	8	8	15	3	4	—	21	—
5	23	13	—	—	4	—	4	14	1	3	9	6	11	—	—	2	23	8

2° 53′ E. Height of Barometer Cistern above Sea, 5,700 feet.

	—	—	—	—	—	—	2	—	—	—	—	2	2	—	1	10	8	27
5	18	2	—	—	1	—	10	—	—	—	8	6	—	—	4	6	6	32
	—	—	—	—	1	—	4	—	—	1	9	1	1	1	2	2	5	40
	—	—	—	—	—	3	1	—	—	—	—	1	—	—	—	2	—	15

Appendix

Annual Abstract of Meteorological Observations taken

OMDURMAN. EGYPT. Lat. 15° 36′ N.

Month.	Mean Pressure—Corrected and reduced to 32° Fahrenheit.	Air Temperature.								Tension of Vapour.	Relative Humidity.		
		Mean at 9 a.m.	Mean daily.	Means of		Abs. Min.		Abs. Max.			Per cent.	Min.	
				Min.	Max.	Temp.	Day.	Temp.	Day.		Mean.	Per cent.	Day.
January ...	28·472	63·6	*	*	89·6	*	*	99·0	22	—	—	—	—
February...	28·636	64·6	75·8	62·2	89·4	54·2	28	96·5	22	—	—	—	—
March ...	28·547	71·1	†	69·5	†	56·5	1	†	†	—	—	—	—
April ...	28·477	80·3	‡	81·2	‡	73·1	30	‡	‡	—	—	—	—
May ...	28·512	82·3	93·3	79·0	107·7	70·4	4	112·6	7	—	—	—	—
‖June ...	—	—	—	—	—	—	—	—	—	—	—	—	—
¶July ..	—	—	—	—	—	—	—	—	—	—	—	—	—
August ...	—	—	—	—	—	—	—	—	—	—	—	—	—
September	—	—	—	—	—	—	—	—	—	—	—	—	—
October ...	—	—	—	—	—	—	—	—	—	—	—	—	—
November	—	—	—	—	—	—	—	—	—	—	—	—	—
December	—	—	—	—	—	—	—	—	—	—	—	—	—
Year ...	—	—	—	—	—	—	—	—	—	—	—	—	—

* Minimum thermometer out of order.
† Maximum thermometer out of order.
‡ Maximum thermometer discarded as unreliable.
§ Insufficient rainfall to register the amount.
‖ Return incomplete.
¶ Returns July to December not received.

FORT NAPIER, NATAL. Lat. 29° 3′ S.

January ..	27·604	72·0	75·1	60·3	89·9	41·2	27	102·2	14, 23	·613	70	34	2
February...	27·670	70·3	72·9	61·1	84·8	53·4	1, 18	99·5	13	·565	62	40	13
March ..	27·632	69·7	73·0	61·1	85·0	46·8	10	98·2	20	·585	64	37	26
April ...	27·699	70·6	72·5	59·2	85·9	49·0	30	94·8	2	·570	59	42	14, 20
May ...	27·745	66·9	67·6	51·8	83·4	31·8	29	91·4	5, 16	·514	63	38	4
June ...	27·875	58·3	60·5	45·2	75·9	39·2	10, 23	88·4	1	·432	66	34	5
July ...	27·790	59·0	61·6	46·6	76·7	38·4	19	92·6	29	·391	59	37	13, 17, 19
August ...	27·739	59·6	62·6	46·4	78·8	32·0	8	92·4	20	·409	58	34	23, 28
September	27·768	66·0	68·4	54·4	82·5	42·0	9	105·0	26	·476	59	32	14
October ...	27·624	69·9	71·6	57·7	85·5	42·0	4	106·2	24	·551	61	34	15
‡November	—	—	—	—	—	—	—	—	—	—	—	—	—
December	—	—	—	—	—	—	—	—	—	—	—	—	—
Year ...	—	—	—	—	—	—	—	—	—	—	—	—	—

* Anemometer blown down on 25th instant. † Anemometer replaced. ‡ First observation 15th instant.
‡ Taking of observations discontinued by order of P.M.O. on account of war in South Africa.

SIERRA LEONE. Lat. 8° 29′ 30″ N.

January ...	29·678	77·8	78·4	73·6	83·2	67·0	26	88·0	10	·749	65	37	23
February ...	29·731	80·0	79·9	75·0	84·9	72·8	6	90·0	7	·807	67	50	3
March	29·700	80·7	80·2	75·1	85·4	70·0	10	89·8	22	·783	64	46	23, 24
April ...	29·707	81·8	80·8	75·7	85·9	68·4	26	90·9	7	·833	67	56	14
May ...	29·718	80·4	78·8	74·2	83·5	70·0	4, 29	90·0	16	·834	71	46	7
June ...	29·754	78·2	77·6	73·0	82·3	68·4	15	88·6	17	·833	81	58	14
July ...	29·759	77·0	76·3	72·0	80·6	67·0	9	86·9	11	·831	83	66	28
August ..	29·753	77·4	76·9	72·6	81·2	67·9	20	87·0	31	·832	82	66	17
September	29·750	79·1	78·1	72·7	83·5	68·0	3	90·0	19	·867	79	59	25
October ...	29·726	80·2	79·8	73·2	86·5	69·0	6	90·5	3	·848	73	59	9, 29
November	29·688	79·8	79·6	73·1	86·2	68·0	2	90·0	24	·846	74	57	3
December	29·701	79·2	80·8	74·4	87·3	70·0	26, 30	92·0	19	·796	68	35	23
Year ...	29·722	79·3	78·9	73·7	84·2	67·0	26th Jany., 9th July.	92·0	19th Dec.	·822	73	35	23rd Dec.

No. XI.—*continued.*

at Netley and Stations Abroad in the Year 1900.

Long 32° 30′ E. Height of Barometer Cistern above Sea, 1,273 feet.

Mean Amount of Cloudiness.	Rainfall.			Weather.								Wind.								
				No. of days of								No. of Observations under each Point per Month.								
	Total.	Max.	Day.	Rain.	Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
·4	—	—	—	—	—	—	—	—	29	—	—	3	11	—	—	—	—	—	8	40
1·1	—	—	—	—	—	—	—	—	19	—	—	4	16	—	—	—	—	—	20	16
·2	—	—	—	—	—	—	—	—	29	—	—	11	18	1	2	—	—	—	5	25
·8	§	§	§	5	—	—	1	—	19	—	—	2	24	1	2	—	4	—	4	23
·8	·04	·04	21	2	—	—	2	—	1	—	—	2	16	2	4	15	2	2	—	19
1	·98	·98	28	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Long. 30° 2′ E. Height of Barometer Cistern above Sea, 2,220 feet.

4·6	3·09	·50	20	18	—	—	5	—	2	10	—	—	—	—	—	—	—	—	62
4·5	2·71	·60	19	8	—	—	1	—	6	7	—	—	—	—	2	—	—	—	54
5·3	1·74	·30	4, 8	13	—	—	—	—	4	5	—	—	—	—	—	—	—	—	62
3·0	1·81	·62	17	5	—	—	4	—	13	1	—	—	—	—	—	—	—	—	60
2·7	·03	·03	27	1	—	—	—	—	18	—	—	—	—	—	—	—	—	—	62
2·8	·04	·04	29	1	—	—	—	—	14	2	—	—	—	—	—	—	—	—	60
2·6	·48	·36	31	2	—	—	—	—	14	3	—	—	—	—	—	—	—	1	61
2·6	·67	·32	24	4	—	—	1	—	18	4	—	—	—	—	—	2	1	1	58
3·2	·72	·25	16	7	—	—	1	—	11	3	—	—	—	—	2	—	—	—	46*
5·0	1·99	·37	25	14	—	1	2	—	8	7	—	—	—	1	—	—	—	—	33†
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Long. 13° 9′ 17″ W. Height of Barometer Cistern above Sea, 224 feet.

2·0	—	—	—	—	—	—	—	—	9	—	—	3	1	24	3	2	3	18	2	6
1·5	—	—	—	—	—	—	—	—	12	1	1	5	2	8	1	1	2	30	6	1
2·0	2·88	2·52	28	4	—	—	3	—	13	—	—	1	2	5	—	—	1	33	17	3
2·5	4·20	2·67	25	6	—	—	8	—	3	—	—	1	2	9	—	1	3	25	15	4
2·5	14·55	3·04	31	18	—	—	15	—	2	—	—	4	1	11	1	—	—	23	8	14
2·0	41·36	5·30	22	25	—	—	11	—	6	—	—	—	—	6	—	1	3	24	11	15
3·0	37·97	5·73	15	27	—	—	7	—	2	—	—	1	—	5	—	—	6	25	9	13
3·0	32·12	6·79	26	24	—	—	4	—	1	—	—	1	1	4	1	3	5	31	7	9
3·0	22·70	6·88	6	22	—	—	17	—	2	—	—	2	1	14	1	1	6	18	6	11
2·5	8·79	1·81	13	22	—	—	19	—	2	—	—	3	2	18	3	—	—	19	8	9
2·5	10·42	2·85	4	14	—	—	18	—	3	—	—	6	—	19	—	—	1	14	5	15
2·0	·34	·34	1	1	—	—	1	—	2	—	—	3	—	18	2	2	—	12	5	20
2·4	175·43	6·88	6th Sept.	163	—	—	103	—	57	1	1	30	12	144	12	11	30	272	99	120

Appendix

Annual Abstract of Meteorological Observations taken

Up Park Camp, Jamaica. Lat. 17° 59′ N.

Month.	Mean Pressure—Corrected and reduced to 32° Fahrenheit.	Air Temperature.								Tension of Vapour.	Relative Humidity.		
		Mean at 9 a.m.	Mean daily.	Means of		Abs. Min.		Abs. Max.			Per cent.	Min.	
				Min.	Max.	Temp.	Day.	Temp.	Day.		Mean.	Per cent.	Day.
January ...	29·802	77·5	79·6	67·8	91·4	64·9	9	94·8	22	·737	65	57	4, 24
February ...	30·090	76·3	79·7	68·2	91·2	61·6	24	96·4	8	·713	66	50	15
March ...	29·810	77·5	79·5	67·9	91·1	60·8	14	95·4	2	·668	62	49	30
April ...	29·338	79·3	80·4	69·0	91·9	62·0	6	96·4	2	·728	65	42	19
May... ...	29·775	80·7	81·2	71·8	90·6	61·2	9	94·8	8	·807	74	52	8, 15
June ...	29·750	81·8	82·3	72·1	92·6	64·4	19	96·2	29	·826	73	50	5
July ...	29·896	81·3	82·1	71·7	92·5	62·3	24	97·2	18	·734	59	38	18
August ...	29·777	83·1	83·3	71·5	95·1	68·3	22	99·2	29, 30	·752	55	38	22,23,24
September ..	29·764	81·6	82·1	71·2	93·0	66·9	22	98·0	24	·792	65	44	21
October ...	29·743	81·3	81·8	69·5	94·2	66·6	13	99·4	2	·894	66	47	28
November ...	29·720	80·2	81·8	69·7	94·0	67·0	24	98·4	18	·753	60	42	28
December ..	29·779	80·1	82·4	68·8	96·0	67·0	10	99·2	14	·722	58	41	16
Year ...	29·770	80·1	81·3	69·9	92·8	60·8	14th March.	99·4	2nd Oct.	·760	64	38	18 July, 22, 23, 24 Aug.

Newcastle, Jamaica. Lat. 18° 0′ 6″ N.

January ...	26·402	67·3	67·0	58·4	75·7	53·4	4	80·4	25	·548	80	47	6
February ...	26·406	66·9	66·8	57·4	76·2	54·2	13	83·2	4	·530	77	46	23
March ...	26·408	66·4	67·1	57·9	76·4	54·0	13	82·4	28	·543	77	48	14
April ...	26·400	69·8	67·5	57·8	77·2	50·4	7	81·8	30	·579	73	47	14
May ..	26·398	70·5	65·3	52·4	78·3	50·2	1	82·4	20	·589	72	56	10
June ...	26·407	72·8	69·1	52·9	85·4	50·2	6	99·0	26	·606	69	51	27
July ...	26·415	70·9	72·3	64·1	80·5	61·4	2	95·4	16	·615	72	53	15, 23
August ..	26·475	74·0	72·7	63·6	81·9	56·2	6	94·6	14	·609	66	38	24
September ...	26·178	71·1	71·5	63·6	79·4	61·4	7	86·0	16	·594	69	45	14
October ...	26·170	72·9	71·1	62·5	79·8	51·4	26	84·4	22	·616	66	50	5, 28
November ..	26·193	70·8	69·9	61·5	78·3	59·0	2	84·2	10	·574	67	54	16
December ...	26·163	70·6	70·1	60·5	79·8	56·2	31	84·2	10	·555	66	53	15
Year ...	26·335	70·3	69·2	59·4	79·1	50·2	1st May, 6th June	99·0	26th June.	·580	71	38	24th Aug.

Barbados. Lat. 13° 7′ 39″ N.

January ...	30·011	78·3	79·5	73·3	85·8	70·0	17	88·0	24	·722	64	51	28
February ...	30·071	77·3	79·3	72·7	85·9	67·8	9	88·0	20	·693	62	51	28
March ...	30·047	77·4	79·7	73·1	86·3	70·8	4	89·0	29	·690	61	43	5
April ...	30·028	79·5	81·6	75·2	88·1	72·0	10	90·0	23	·704	58	48	19
May ..	30·030	79·9	81·8	76·3	87·4	73·0	17	89·5	2, 10	·747	63	54	4, 5, 9, 17
June ...	30·047	80·0	81·4	76·0	86·8	74·0	30	89·0	24	·765	64	55	10, 11
July ...	30·050	80·7	81·6	76·0	87·2	72·5	28	89·0	22	·761	63	55	4, 16, 31
August ...	30·024	82·4	81·9	76·0	87·8	74·0	16, 31	90·0	27, 30	·796	67	57	8, 10
September ...	29·992	81·5	82·2	76·1	88·4	73·5	1	92·0	12, 13	·809	67	54	2
October ...	29·968	80·7	82·1	76·0	88·2	74·0	9, 17	90·0	3, 9, 31	·814	66	50	14
November ...	29·896	80·7	81·8	75·4	88·2	73·2	19	91·0	5	·795	67	53	9
December ...	30·030	78·7	80·3	74·9	85·7	72·0	27	89·2	3	·770	70	55	25
Year ...	30·016	79·8	81·1	75·1	87·1	67·8	9th Feby.	92·0	12th, 13th Sept.	·755	64	43	8th March.

No. XI.—*continued.*

at Netley and Stations Abroad in the Year 1900.

Long. 76° 56′ W. Height of Barometer Cistern above Sea, 245 feet.

Mean Amount of Cloudiness.	Rainfall.			Weather.								Wind.								
				No. of days of								No. of Observations under each Point per Month.								
	Total.	Max.	Day.	Rain.	Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
5·1	·54	·12	11	11	—	—	—	—	—	1	—	1	17	—	28	—	5	—	5	6
3·0	·24	·09	27	6	—	—	—	—	—	3	—	14	16	—	13	3	—	—	—	10
4·0	·47	·40	6	5	—	—	—	—	—	1	—	6	12	—	41	1	1	—	—	1
4·5	2·07	1·12	23	10	—	—	—	—	—	1	—	—	1	2	47	6	—	—	—	4
5·0	5·90	1·84	15	10	—	—	—	—	—	1	—	—	—	8	43	8	—	—	—	3
3·0	3·61	1·18	6	7	—	—	2	—	—	—	—	—	4	13	37	4	1	—	—	1
5·3	3·88	2·05	24	11	—	—	3	—	1	2	—	9	9	5	26	2	1	2	4	4
5·0	1·83	·65	6	7	—	—	2	—	—	—	—	8	1	2	20	5	9	3	11	3
6·0	9·20	5·20	6	12	—	—	3	—	—	4	—	9	8	1	19	6	6	2	4	5
5·0	1·38	·56	11	9	—	—	—	—	—	—	—	11	12	3	10	2	14	3	3	4
5·8	·85	·34	19	7	—	—	—	—	—	2	—	9	7	2	8	5	12	7	9	1
5·0	·64	·34	19	3	—	—	—	—	1	1	—	8	4	2	17	3	18	2	5	3
1·7	30·61	5·20	6th Sept.	98	—	—	10	—	2	16	—	75	91	38	309	45	67	19	41	45

Long. 76° 0′ 42″ W. Height of Barometer Cistern above Sea, 3,800 feet.

4·5	5·38	·84	3	22	—	—	—	—	2	20	—	11	7	8	—	—	—	—	2	34
5·5	1·45	·66	18	7	—	—	—	—	2	—	—	7	4	8	3	1	—	—	3	30
6·5	4·88	1·30	5	9	—	—	—	—	—	4	—	—	60	—	—	—	—	—	1	1
6·5	2·14	·75	15	9	—	—	—	—	—	5	—	4	13	3	3	—	—	—	4	33
7·0	8·16	3·25	15	14	—	—	2	—	1	11	—	—	—	9	7	—	—	—	—	46
6·5	7·51	1·75	1	13	—	—	1	—	—	30	—	1	—	2	1	—	—	—	—	56
5·4	2·89	·60	27	11	—	—	—	—	1	8	—	3	6	2	11	—	1	—	1	38
4·5	5·00	2·25	28	6	—	—	2	—	—	—	—	—	6	1	7	—	—	—	2	46
5·5	16·14	6·00	6	16	—	—	2	—	—	16	—	—	3	3	10	—	1	—	7	36
5·0	10·42	2·50	9	21	—	—	4	—	—	4	—	—	—	—	4	—	—	—	3	55
4·7	8·56	4·00	19	13	—	—	—	—	—	14	—	—	7	—	3	—	—	—	8	42
4·0	8·80	6·75	18	13	—	—	—	—	—	4	—	—	1	—	3	—	—	—	13	45
5·5	81·33	6·75	18th Dec.	154	—	—	11	—	6	116	—	26	107	36	52	1	2	—	44	462

Long. 59° 40′ 8″ W. Height of Barometer Cistern above Sea, 30 feet 8 inches.

4·0	2·88	·40	10	17	—	—	—	—	—	—	—	—	43	—	1	—	—	—	—	18
3·5	2·07	1·00	5	15	—	—	—	—	—	—	—	—	42	4	—	—	—	—	—	10
4·5	1·38	·25	18	14	—	—	—	—	—	—	—	—	44	1	7	—	—	—	—	10
3·5	1·78	·60	23	14	—	—	—	—	—	—	—	—	31	4	8	—	—	—	—	17
4·0	10·21	4·40	17	19	—	—	—	—	—	—	—	—	13	11	24	—	—	—	—	14
3·5	2·53	·70	24	21	—	—	—	—	—	—	—	—	6	2	30	—	—	—	—	22
5·0	6·28	1·15	8	24	—	—	—	—	—	—	—	—	38	10	6	—	—	—	—	8
5·0	7·34	1·75	21	25	—	—	—	—	—	—	—	1	27	8	10	—	—	—	—	16
5·5	6·40	2·95	2	15	—	—	—	—	—	—	—	—	30	5	9	—	—	—	—	16
5·0	4·28	·90	15	23	—	—	—	—	—	—	—	—	24	3	9	—	—	—	—	26
5·0	4·35	1·45	25	16	—	—	—	—	—	—	—	—	24	—	6	—	—	—	—	30
4·5	3·59	1·45	9	15	—	—	—	—	—	—	—	—	42	1	3	—	—	—	—	16
4·4	53·09	4·40	17th May.	218	—	—	—	—	—	—	—	1	364	49	113	—	—	—	—	203

Appendix

Annual Abstract of Meteorological Observations taken

St. Lucia. Lat. 14° 0′ 13″ N.

Month.	Mean pressure — Corrected and reduced to 32° Fahrenheit.	Air Temperature.								Tension of Vapour.	Relative Humidity.		
		Mean at 9 a.m.	Mean daily.	Means of		Abs. Min.		Abs. Max.			Per cent.	Min.	
				Min.	Max.	Temp.	Day.	Temp.	Day.		Mean.	Per cent.	Day.
January ...	29·238	74·0	75·8	70·5	81·1	67·4	15	83·6	2	·646	72	60	29
February ...	29·294	73·4	75·3	69·6	81·1	67·6	13, 27	84·2	9	·621	70	53	14
March ...	29·267	73·4	75·7	69·9	81·5	66·0	5	84·8	13, 29	·609	69	51	5
April ...	29·243	76·1	77·8	71·9	83·7	70·0	4, 10	87·2	5, 6	·664	70	53	4
May ...	29·274	77·3	78·3	72·8	83·9	70·0	27	85·8	4, 11	·698	72	59	28
June ...	29·255	77·3	78·3	72·9	83·7	69·2	26	86·2	14, 15	·727	75	61	24
July ...	29·247	78·2	78·6	73·4	83·9	67·8	8	86·2	19	·749	77	55	19
August ...	29·249	78·2	79·2	73·7	84·8	70·8	31	88·4	27	·767	76	62	6
September ...	29·232	78·7	79·4	73·7	85·2	69·4	1	87·4	9, 10	·765	73	57	23
October ...	29·201	78·6	78·8	73·0	84·7	69·8	10	87·2	4	·778	76	63	30
November ...	29·189	77·6	76·5	72·4	80·6	70·2	23	86·2	5	·747	75	62	5
December ...	29·255	73·1	77·3	72·1	82·5	69·8	17	84·8	1	·718	72	56	30
Year ...	29·245	76·3	77·6	72·2	83·1	66·0	5th March.	88·4	27th Aug.	·707	73	51	5th March.

Bermuda. Lat. 32° 17′ 40″ N.

January ...	29·989	61·5	62·8	58·5	67·1	53·0	10	73·4	13	·464	76	57	20
February ...	29·935	60·1	62·1	58·5	65·7	49·6	20	73·4	17	·436	75	59	21
March ...	29·907	61·5	62·5	57·5	67·5	48·6	14	71·8	31	·461	75	57	23
April ...	29·920	63·7	64·4	59·6	69·3	49·6	30	74·2	20	·480	72	53	26
May... ...	29·969	69·1	69·0	74·0	64·0	56·8	12	78·4	15, 16	·608	77	55	29, 31
June ...	29·961	73·8	74·1	69·1	79·1	61·8	1	83·0	30	·738	80	59	1, 21
July ...	30·022	79·0	79·3	73·1	85·6	67·2	5	91·2	26	·781	69	50	18
August ...	29·941	78·4	79·4	74·0	84·9	68·8	6	89·8	18	·799	72	53	5, 7
September...	29·911	75·8	76·8	71·4	82·2	59·2	18	88·6	14	·702	69	53	3
October ...	29·947	72·6	73·7	69·7	77·8	64·8	19, 22	82·6	14	·669	75	52	22
November ...	29·982	69·0	69·5	65·1	74·0	59·4	18	78·6	8	·568	72	51	1
December ...	29·940	62·9	64·7	60·6	68·9	53·6	20	75·8	5	·471	73	56	1, 6
Year ...	29·952	68·9	69·9	65·9	73·8	48·6	14th March.	91·2	26th July.	·598	74	50	18th July.

No. XI.—*continued.*

at Netley and Stations Abroad in the year 1900.

Long. 61° 0′ 25″ W. Height of Barometer Cistern above Sea, 744 feet.

Mean Amount of Cloudiness.	Rainfall. Total.	Max.	Day.	Rain.	Weather. No. of days of Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	Wind. No. of Observations under each Point per Month. N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
5·0	2·86	·35	5	24	—	—	—	—	—	—	1	1	48	10	3	—	—	—	—	—
5·0	3·33	·67	15	17	—	—	—	—	—	—	—	2	43	10	1	—	—	—	—	—
5·5	3·26	·78	13	17	—	—	—	—	—	—	—	1	50	7	3	1	—	—	—	—
5·0	4·62	1·34	24	19	—	—	—	—	—	—	—	1	28	21	10	—	—	—	—	—
5·0	8·54	1·68	31	29	—	—	—	—	—	—	—	—	36	15	11	—	—	—	—	—
5·3	7·50	1·46	24	24	—	—	—	—	—	—	—	—	16	10	34	—	—	—	—	—
6·0	9·21	1·85	6	28	—	—	—	—	—		—	—	42	10	10	—	—	—	—	—
5·0	13·51	4·22	31	27	—	—	3	2	—	—	—	—	39	13	9	1	—	—	—	—
5·0	8·04	1·70	18	23	—	—	1	—	—	—	—	—	20	13	23	4	—	—	—	—
5·0	12·44	2·28	1	27	—	—	2	—	—	1	—	—	28	18	16	—	—	—	—	—
4·5	6·92	·93	27	22	—	—	—	—	1		—	—	32	10	17	1	—	—	—	—
4·0	3·36	·47	3	24	—	—	—	—	—	—	—	—	53	8	1	—	—	—	—	—
5·0	83·59	4·22	31st Aug.	281	—	—	6	2	1	1	1	5	435	145	138	7	—	—	—	—

Long. 64° 47′ W. Height of Barometer Cistern above Sea, 151 feet.

7·0	5·59	1·90	25	21	—	—	1	—	1	5	—	3	12	2	4	1	19	1	5	15
7·6	5·05	1·12	22, 25	17	—	—	1	—	—	9	4	3	8	—	3	3	7	7	16	9
7·9	8·08	1·96	25	18	—	—	3	—	—	11	4	8	3	—	3	2	18	10	7	11
5·7	1·59	·42	5	13	—	—	1	—	1	3	1	3	11	3	1	3	10	15	9	5
6·3	7·47	1·60	10	12	—	—	2	—	1	6	—	2	10	—	7	1	28	1	5	8
6·5	4·95	1·96	19	11	—	—	1	—	1	7	—	2	1	8	17	1	24	3	2	2
4·9	2·38	1·12	28	9	—	—	5	—	2	1	—	1	5	2	8	—	32	1	9	4
6·2	6·02	2·02	21	13	—	—	—	—	1	1	—	2	4	3	2	—	22	8	17	4
5·8	9·06	2·62	17	17	—	—	3	—	—	2	1	3	12	15	8	2	5	—	6	9
6·8	3·15	·68	9	20	—	—	—	—	—	8	—	—	7	7	19	9	6	6	2	6
5·8	4·00	·86	27	21	—	—	1	—	—	2	—	2	9	8	7	5	11	1	6	11
7·5	8·18	2·02	14	21	—	—	—	—	—	8	1	8	8	2	4	5	10	3	14	8
6·5	66·42	2·62	17th Sept.	193	—	—	23	—	7	66	11	37	90	50	83	32	192	56	98	92

Appen

Annual Abstract of Meteorological Observations take

Fort Canning, Singapore. Lat. 1° 16 N.

Months.	Pressure of the Atmosphere. Corrected and reduced to 32° Fahrenheit.	Air Temperature. Means of 24 hours.	Means of Daily.	Means of		Abs. Min.		Abs. Max.		Tension of Vapour.	Relative Humidity. Per cent.	
				Min.	Max.	Temp.	Day.	Temp.	Day.		Means.	Per cent.
January	29 [illegible]	—	[illegible]	[illegible]	[illegible]	[illegible]	15, 26	[illegible]	11	·903	77	94
February	29 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	25	[illegible]	15	·863	79	97
March	29 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6	[illegible]	14, 22	·905	80	72
April	29 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	15, 17	[illegible]	27	·921	77	87
May	29 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	15	[illegible]	11	·789	69	41
June	29 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	13	[illegible]	17	·820	80	43
July	29 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3	[illegible]	30	·775	66	32
August	29 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	14	[illegible]	24	·756	71	38
September	29 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7, 15, 27	[illegible]	11	·832	72	55
October	29 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5	[illegible]	2	·830	75	58
November	29 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	30, 29	[illegible]	13	·827	78	56
December	29 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	15	[illegible]	12	·831	74	73
Year	29 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] June.	[illegible]	15 Feb.	·811	72	61

Hong Kong. Lat. 22° 16′ 20 N.

January	[illegible]	[illegible]	*	*	[illegible]	*	*	[illegible]	21	·891	82	59
February	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6	[illegible]	26	·885	77	57
March	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	13	[illegible]	31	·885	82	57
April	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3	[illegible]	30	·716	80	56
May	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2	[illegible]	28	·796	75	52
June	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	25	[illegible]	2	·838	76	54
July	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4, 26	[illegible]	22	·912	76	61
August	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	31	[illegible]	19	·936	71	50
September	*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	28	[illegible]	7	·804	66	49
October	*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	23	[illegible]	2	·682	63	45
November	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	17	[illegible]	7, 9, 10	·540	66	44
December	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9	[illegible]	3, 4, 5	·442	61	29
Year	—	71·4	—	—	91·6	—	—	99·0	2nd June.	·661	73	28

* Minimum thermometer out of order. † Barometer out of order.

No. XI.—*continued.*

at Netley and Stations Abroad in the Year 1900.

Long. 103° 53′ E. Height of Barometer Cistern above Sea, 110 feet.

Mean Amount of Cloudiness.	Rainfall.			Weather.							Wind.							
				Number of Days of							No. of Observations under each Point per Month.							
	Total.	Max.	Day.	Rain.	Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
7·0	8·69	2·22	12	16	—	—	1	—	—	11	—	14	2	—	2	2	17	1	2	22
4·5	3·63	1·20	7	8	—	—	1	—	—	3	—	12	9	13	6	—	—	—	5	11
4·5	5·23	1·30	7	10	—	—	1	—	—	14	—	7	4	17	9	4	2	7	1	11
5·5	10·95	2·26	12	13	—	—	4	—	—	5	—	5	3	13	12	9	5	5	—	8
6·0	10·15	1·60	3	12	—	—	3	—	—	4	—	4	1	14	9	9	6	11	—	8
5·0	6·29	1·24	7	12	—	—	6	—	—	4	—	3	2	13	9	9	11	11	2	—
5·0	10·81	1·80	10	13	—	—	6	—	—	10	—	1	3	16	11	8	5	14	4	—
4·5	8·41	1·64	20	10	—	—	5	—	—	8	2	7	2	11	4	2	12	23	1	—
3·5	4·23	1·50	5	6	—	—	3	—	—	6	—	4	—	18	6	2	6	24	—	—
4·5	7·28	2·35	20	12	—	—	6	—	—	10	—	2	—	18	9	7	8	17	1	—
5·0	13·67	2·45	18	18	—	—	5	—	—	14	—	3	3	19	2	3	10	14	6	—
3·5	4·95	1·20	23	9	—	—	3	—	—	6	—	—	—	12	6	16	7	18	3	—
4·9	94·29	2·45	18th Nov.	139	—	—	44	—	—	95	2	62	29	164	85	71	89	145	25	60

Long. 114° 8′ 16″ E. Height of Barometer Cistern above Sea, 18 feet.

3·6	·66	·45	3	3	—	—	—	—	6	16	—	6	6	3	6	4	11	1	6	19
3·6	2·49	1·12	19	5	—	—	—	—	10	17	—	2	8	—	—	1	13	2	7	23
5·0	4·54	1·15	30	14	—	—	—	—	6	23	—	2	6	6	2	—	7	—	7	32
3·4	2·43	1·29	2	6	—	—	—	—	10	13	—	—	6	1	7	—	11	1	4	30
2·6	12·31	6·05	13	9	—	—	2	—	12	7	—	1	1	1	6	5	16	1	2	28
4·2	32·13	6·04	29	22	—	—	4	—	6	18	—	—	2	—	5	2	16	—	5	30
3·0	9·96	1·37	27	21	—	—	1	—	6	13	—	—	2	—	8	1	14	—	6	31
2·2	6·95	2·03	29	12	—	—	1	—	8	6	—	—	1	—	13	3	8	—		27
5·8	6·42	3·30	10	6	—	—	—	—	10	13	—	—	9	—	5	2	13	—	6	25
2·0	2·94	1·70	10	4	—	—	—	—	7	3	—	—	4	1	3	1	14	1	14	24
2·9	7·77	6·50	9	5	—	—	—	—	6	10	—	—	9	1	8	1	10	—	7	24
1·0	·19	·10	14	3	—	—	—	1	22	—	—	—	23	6	3	—	5	—	1	24
3·3	88·79	6·50	9th Nov.	119	—	—	8	1	109	139	—	11	77	19	66	20	138	6	76	317

Summary of Results of Meteorological Ob

	Altitude above Sea Level.	Latitude.	Longitude.	Mean Daily Air Temp.	Air Pressure—reduced and corrected to 32° F.	Air Temperature.							Tension of Vapour.	Relativ Per Cent
						Mean, 9 a.m.	Means of		Abs. Min.		Abs. Max.			
							Min.	Max.	Temp.	Date.	Temp.	Date.		Mean.
	ft.	° ′ ″	° ′ ″											
ıean:														
...	52	36 6 20 N.	5 20 53 W.	64·3	29·962	61·5	57·9	70·7	41 6	30 Jan.	97·0	20 June	·450	69
...	112	35 53 49 N.	14 30 54 E.	66·9	29·876	64·8	62·7	71·1	43·4	13, 14 Jan.	90·6	28 June	·496	69
...	60	41 0 0 N.	29 3 0 E.	59·8	29·876	56·9	51·8	67·9	26·2	10 March	96·4	28 July	·388	69
edia	460	34 42½ 0 N.	30 1 0 E.	—	—	—	—	—	—	—	—	—	—	—
odos	5,700	34 54 0 N.	32 53 0 E.	—	—	—	—	—	—	—	—	—	—	—
ıan ...	1,273	15 36 0 N.	32 30 0 E.	—	—	—	—	—	—	—	—	—	—	—
Fort	2,220	29 3 0 S.	30 2 0 E.	—	—	—	—	—	—	—	—	—	—	—
ne ...	224	8 29 30 N.	13 9 17 W.	78·9	29·722	79·3	73·7	84·2	67·0	{26 Jan. 9 July}	92·0	19 Dec.	·822	73
ıs:														
s ...	30½	13 7 39 N.	59 40 8 W.	81·1	30·016	79·8	75·1	87·1	67·8	9 Feb.	92·0	12, 13 Sept.	·755	64
a ...	744	14 0 13 N.	61 0 25 W.	77·6	29·245	76·3	72·2	83·1	66·0	5 March	88·4	27 Aug.	·707	73
Park	245	17 59 0 N.	76 56 0 W.	81·3	29·770	80·1	69·9	92·8	60·8	14 March	99·4	2 Oct.	·760	64
le ...	3,800	18 0 6 N.	76 0 42 W.	69·2	26·335	70·3	59·4	79·1	50·2	{1 May 6 June}	99·0	26 June	·580	71
...	151	32 17 40 N.	64 47 0 W.	69·9	29·952	68·9	65·9	73·8	48·6	14 March	91·2	26 July	·593	74
:														
ining	110	1 16 0 N.	103 53 0 E.	79·5	29·735	78·1	71·4	87·7	57·1	10 June	99·4	15 Feb.	·811	72
g ...	18	22 16 20 N.	114 8 16 E.	*	†	71·4	*	81·6	*	*	99·0	2 June	·661	73

* Minimum thermometer out of order. † Barometer out of or

taken at Stations Abroad during 1900.

Mean Amount of Cloudiness.	Rainfall.			Weather.								Wind.									No. of h in wh Observa were ta
				Number of Days of								Number of Observations under each Point.									
	Total.	Max.	Date.	Rain.	Snow.	Hail.	Thunder Storms.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.	
4·1	34·01	2·60	16 Sept.	91	—	1	4	—	139	73	4	1	12	266	7	3	68	193	143	31	12
3·8	15·95	1·16	13 Jan.	84	—	8	15	—	107	21	12	38	147	11	124	23	87	29	260	11	12
5·3	21·71	1·71	3 Dec.	121	5	2	13	26	83	96	1	51	289	60	27	78	107	14	10	94	12
—	—	—	—	-	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9
—	—	—	—	-	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4
—	—	—	—	-	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—	6
—	—	—	—	-	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—	10
2·4	175·43	6·88	6 Sept.	163	—	—	103	—	57	1	1	30	12	144	12	11	30	272	99	120	12
4·4	53·09	4·40	17 May	218	—	—	—	—	--	—	—	1	364	49	113	—	—		—	203	12
5·0	83·59	4·22	31 Aug.	281	—	—	6	2	1	1	1	5	435	145	138	7	—		—	—	12
4·7	30·61	5·20	6 Sept.	98	—	—	10	—	2	16	—	75	91	38	309	45	67	19	41	45	12
5·5	81·33	6·75	18 Dec.	154	—	—	11	—	6	116	—	26	107	36	52	1	2		44	462	12
6·5	66·42	2·62	17 Sept.	193	—	—	23	—	7	66	11	37	90	50	83	32	192	56	98	92	12
4·9	94·29	2·45	18 Nov.	139	—	—	44	—	—	95	2	62	29	164	85	71	89	145	25	60	12
3·3	88·79	6·50	9 Nov.	110	—	—	8	1	109	139	—	11	77	19	66	20	138	6	76	317	12

APPENDIX No. XII.

THE PARKES MEMORIAL PRIZE.

Surgeon-General W. Taylor, M.D., C.B., K.H.P. Director-General, *President of Committee.*

Colonel J. Lane-Notter, M.A., M.D., *Treasurer*

Major W. H. Horrocks, M.B., B.Sc., *Secretary.*

Prize Essay Medallists.

1883. Surgeon R. J. Polden, Indian Medical Service.
1886. Surgeon A. Duncan, M.D., Indian Medical Service.
1889. Surgeon R. H. Firth, F.R.C.S. Eng., Medical Staff.
1892. Surgeon-Captain R. H. Firth, F.R.C.S. Eng., Army Medical Staff.
1895. Surgeon-Major R. Ross, Indian Medical Service.
1898. Surgeon-Captain F. Smith, Army Medical Staff.
1901. Captain H. A. L. Howell, Royal Army Medical Corps.

The following is the subject for the next prize :—

"On the Prevention of Disease amongst Armies engaged in Active Operations in the Field, with Special Reference to the Sanitary Organization of a Field Force."

The Prize is Seventy-five Guineas in Money and a Bronze Medal, and is Awarded Triennially.

The Competition is open to all Medical Officers of the Army, Navy, and Indian Services of Executive Rank on full pay, with the exception of the Assistant Professors of the Army Medical School during their term of office. Essays to be sent to the Secretary of the "Parkes Memorial Fund," Royal Victoria Hospital, Netley, on or before the 31st day of December, 1903, Each essay to have a motto, and to be accompanied with a sealed envelope bearing the same motto and containing the name of the competitor.

APPENDIX No. XIII

THE ALEXANDER MEMORIAL FUND

TRUSTEES.

Surgeon-General J. JAMESON, M.D., LL.D., C.B., K.H.S.
Surgeon-Major-General J. B. C. READE, C.B., K.H.S.
Lieutenant-Colonel W. G. DON, M.D.

COMMITTEE.

Surgeon-General W. TAYLOR, M.D., C.B., K.H.P., Director-General, *President.*
Surgeon-General J. JAMESON, M.D., LL.D., C.B., K.H.S.
Surgeon-Major-General J. B. C. READE, C.B., K.H.S.
Lieutenant-Colonel W. G. DON, M.D.
Colonel W. F. STEVENSON, M.B., C.B.
Lieutenant-Colonel A. F. S. CLARKE, M.D.
Lieutenant-Colonel W. JOHNSTON, M.D.
Lieutenant-Colonel E. M. WILSON, C.M.G., D.S.O., *Honorary Secretary.*

PRIZE ESSAY GOLD MEDALLISTS.

1870. Assistant Surgeon A. B. R. MYERS, Coldstream Guards.
1873. Surgeon F. H. WELCH, F.R.C.S. Eng., Medical Department.
1876. Surgeon-Major J. H. PORTER, Medical Department.
1879. Surgeon JOHN MARTIN, Medical Department.
1882. Surgeon-Major F. H. WELCH, F.R.C.S. Eng., Medical Department.
1885. Surgeon JOHN MARTIN, Medical Staff.
1888. Surgeon R. H. FIRTH, F.R.C.S. Eng., Medical Staff.
1891. Surgeon R. H. FIRTH, F.R.C.S. Eng., Medical Staff.
1894. Surgeon-Captain C. BIRT, Army Medical Staff.
1897. Surgeon-Major C. BIRT, Army Medical Staff.
1900. No Medal awarded.

At a meeting of the Committee held at 18, Victoria Street, S.W., on 7th December, 1900, the Honorary Secretary reported that no essays had been received for the competition previously announced, and the Committee decided that the same subject should again form the thesis, viz. :—"Injuries "to joints and long bones caused by modern small-arm projectiles; their "nature, diagnosis, and treatment; with special reference to the appliances "required and available on field service."

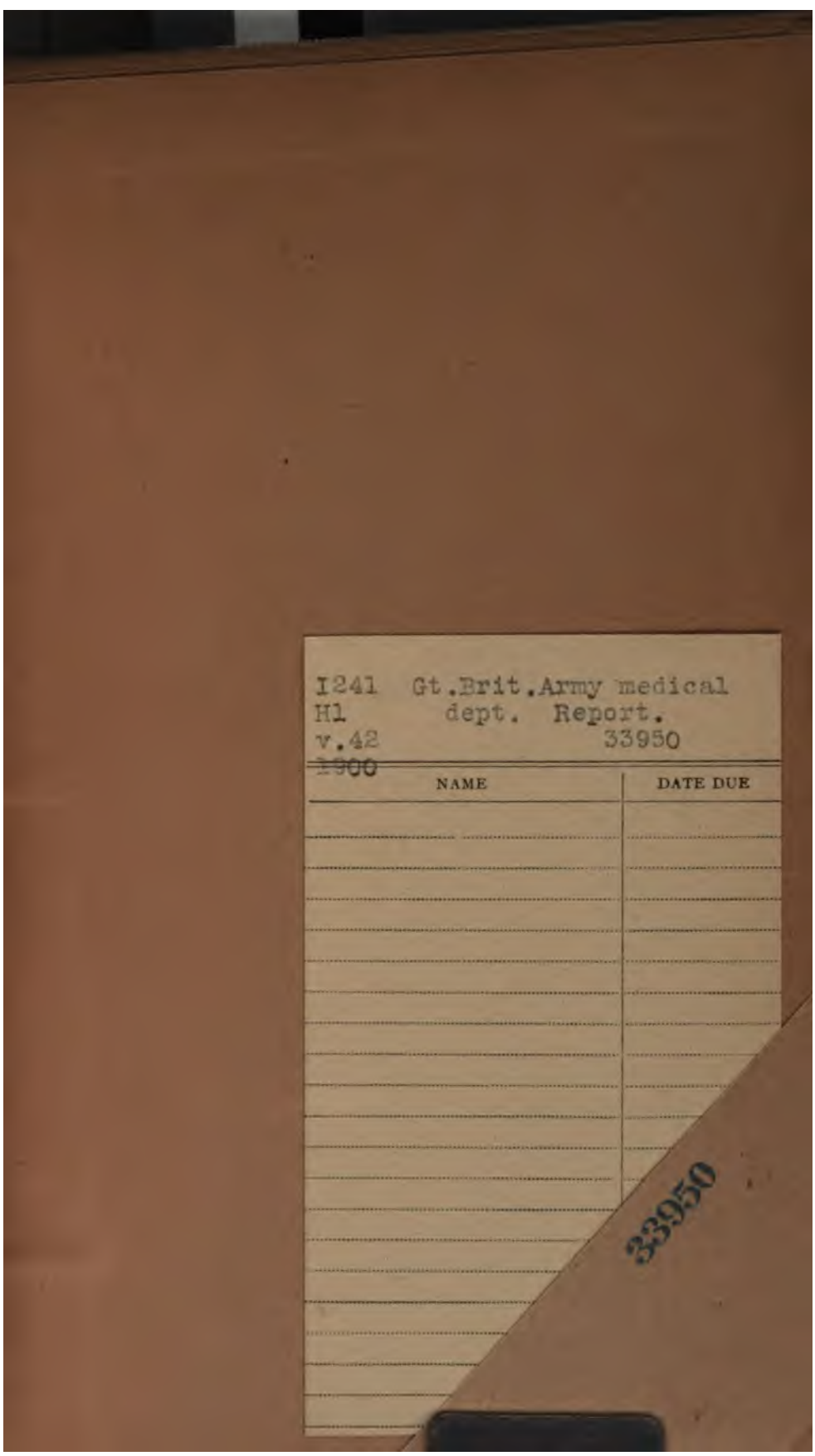
Essays must reach the President of the Committee on or before 31st December, 1902.

Essays are to be legibly written, superscribed with a brief motto, and accompanied by a sealed envelope similarly superscribed, containing the name and address of the author.

No essay shall exceed in length fifty pages of ordinary printed octavo, which may be estimated as amounting to 20,000 words. This limit is exclusive of tables which may be added in the form of appendices.

The competition is limited to executive officers of the Royal Army Medical Corps on full pay; but Professors and Assistant Professors at Netley are not allowed to compete while so employed.

By order of the Committee,
E. M. WILSON, Lieutenant-Colonel, R.A.M.C., *Hon. Sec.*


I241 Gt.Brit.Army medical
H1 dept. Report.
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NAME | DATE DUE

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